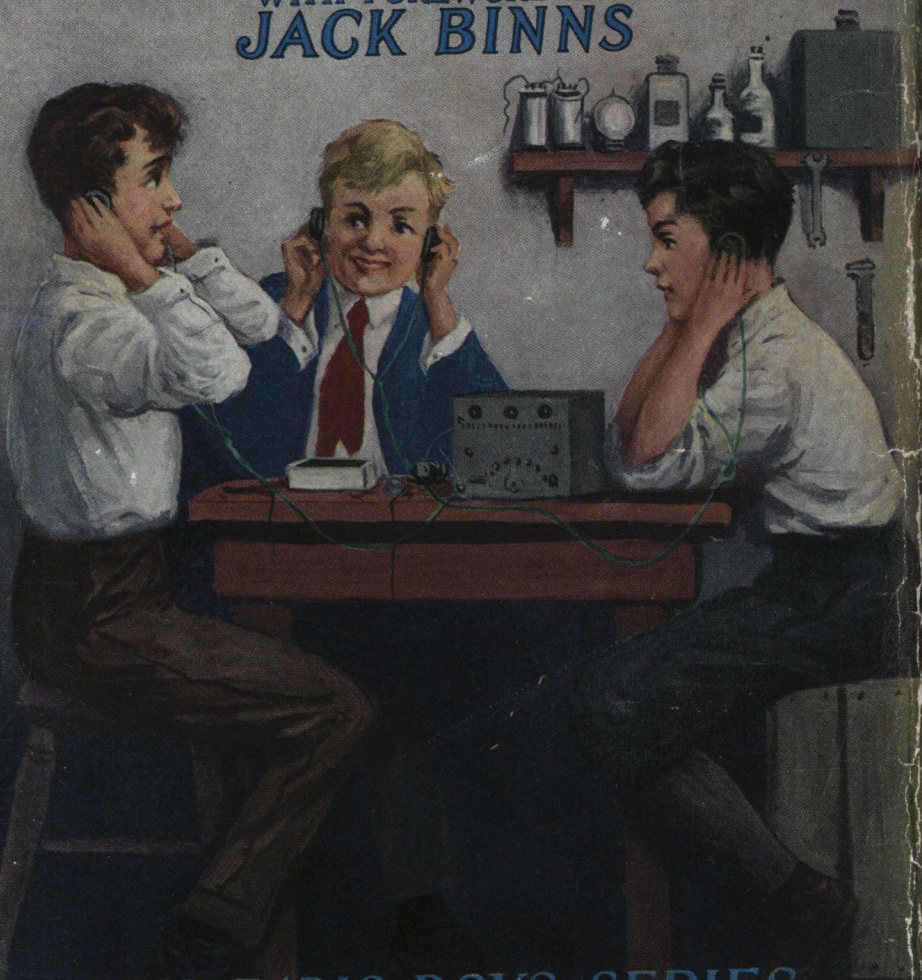
The RADIO BOYS' FIRST WIRELESS

BY ALLEN CHAPMAN

WITH FOREWORD BY
JACK BINNS



THE RADIO BOYS SERIES
(TRADEMARK REGISTERED)

THE RADIO BOYS SERIES

(Trademark Registered)

The Radio Boys First Wireless; Or, Winning the Pemberton Prize

By ALLEN CHAPMAN

Author of "The Railroad Series,"
With a Foreword by Jack Binns, Radio Expert

A captivating tale, showing how several boys of a small town became interested in radiophoning and how they set about making their own receiving apparatus. They had, of course, a number of rivals, and when a rich man of that vicinity offered a prize for the best made amateur set, their rivals did what they could to bring their hard work to naught, even going so far as to make off with the apparatus that was to be placed in the competition.

The story gives many directions for building a small wireless receiving set, and also tells of radio work in general, how airships and other vessels have been guided by wireless, how even an automobile has been steered by radio, and how the Government traces an unlicensed sending station.

A book any boy will read with avidity---and many a grown person will also want to dip into it.

THIS VOLUME CONTAINS FULL DIRECTIONS FOR MAKING A HOME RADIO RECEIVING SET

the (

1921

THE RADIO BOYS SERIES

(Trademark Registered)

By ALLEN CHAPMAN

Author of the "RAILROAD SERIES," Etc.

With a Foreword by Jack Binns, Radio Expert of the *New York Tribune*

Illustrated. Individual colored wrappers for each story

A new series for boys giving full details of radio work, both in sending and receiving—showing how small and large amateur sets can be made and operated, and how some boys got a lot of fun and adventure out of what they did. Each volume from first to last is so thoroughly fascinating, so strictly up-to-date and accurate, we feel sure all lads will peruse them with great delight.

Each volume has a Foreword by Jack Binns, the well-known radio expert of the *New York Tribune*.

THE RADIO BOYS' FIRST WIRELESS ; Or, Winning the Ferberton Prize

THE RADIO BOYS AT OCEAN POINT ; Or, The Message That Saved the Ship

THE RADIO BOYS AT THE SENDING STATION ; Or, Making Good in the Wireless Room

THE RADIO BOYS AT MOUNTAIN PASS; Or, The Midnight Call for Assistance

THE RADIO BOYS TRAILING A VOICE; Or, Solving a Wireless Mystery

GROSSET & DUNLAP, NEW YORK

THE FIRST VOLUME OF THIS SERIES CONTAINS FULL DIRECTIONS

BEST BOOKS FOR BOYS

Each Volume Illustrated and Durably Bound. Colored Wrappers

THE RAILROAD SERIES

By ALLEN CHAPMAN

In this line of books there is revealed the whole workings of the great railroad system. There are adventures in abundance—railroad wrecks, dashes through forest fires, the pursuit of a "wildcat" locomotive, the disappearance of a pay car with a large sum of money on board—but there is much more than this—the intense rivalry among railroads and railroad men, the working out of running schedules, the getting through "on time" in spite of all obstacles, and the manipulation of railroad securities by evil men who wish to rule or ruin.

Books that every American boy ought to own.

RALPH OF THE ROUND HOUSE ;
Or, Bound to Become a Railroad Man.

RALPH IN THE SWITCH TOWER ;
Or, Clearing the Track.

RALPH ON THE ENGINE ;
Or, The Young Fireman of the Limited Mail.

RALPH ON THE OVERLAND EXPRESS ;
Or, The Trials and Triumphs of a Young Engineer.

RALPH, THE TRAIN DISPATCHER ;
Or, The Mystery of the Pay Car.

RALPH ON THE ARMY TRAIN ;
Or, The Young Railroader's Most Daring Exploit.

THE TOM SWIFT SERIES

By VICTOR APPLETON

Every youngster is filled with the marvels of invention displayed in motor cars, motor boats, submarine boats and airships. It is the purpose of these spirited tales to convey in a realistic way the wonderful advances in land and sea locomotion.

TOM SWIFT AND HIS MOTOR CYCLE
TOM SWIFT AND HIS MOTOR BOAT
TOM SWIFT AND HIS AIRSHIP
TOM SWIFT AND HIS SUBMARINE BOAT
TOM SWIFT AND HIS ELECTRIC RUNABOUT
TOM SWIFT AND HIS WIRELESS MESSAGE
TOM SWIFT AMONG THE DIAMOND MAKERS
TOM SWIFT IN THE CAVES OF ICE
TOM SWIFT AND HIS SKY RACER
TOM SWIFT AND HIS ELECTRIC RIFLE
TOM SWIFT IN THE CITY OF GOLD
TOM SWIFT AND HIS AIR GLIDER
TOM SWIFT IN CAPTIVITY
TOM SWIFT AND HIS WIZARD CAMERA
TOM SWIFT AND HIS GREAT SEARCHLIGHT
TOM SWIFT AND HIS GIANT CANNON
TOM SWIFT AND HIS PHOTO TELEPHONE
TOM SWIFT AND HIS AERIAL WARSHIP
TOM SWIFT AND HIS BIG TUNNEL
TOM SWIFT IN THE LAND OF WONDERS
TOM SWIFT AND HIS WAR TANK
TOM SWIFT AND HIS AIR SCOUT
TOM SWIFT AND HIS UNDERSEA SEARCH
TOM SWIFT AMONG THE FIRE FIGHTERS
TOM SWIFT AND HIS ELECTRIC LOCOMOTIVE

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

The RADIO BOYS' FIRST WIRELESS

by
ALLEN CHAPMAN

WITH FOREWORD BY
JACK BINNS

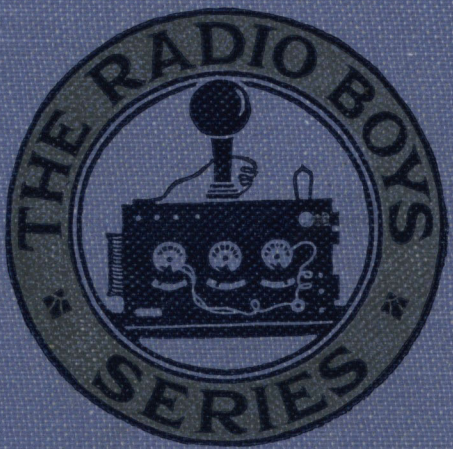
GROSSET & DUNLAP

THE RADIO BOYS' FIRST WIRELESS

ALLEN CHAPMAN

Grosset & Dunlap

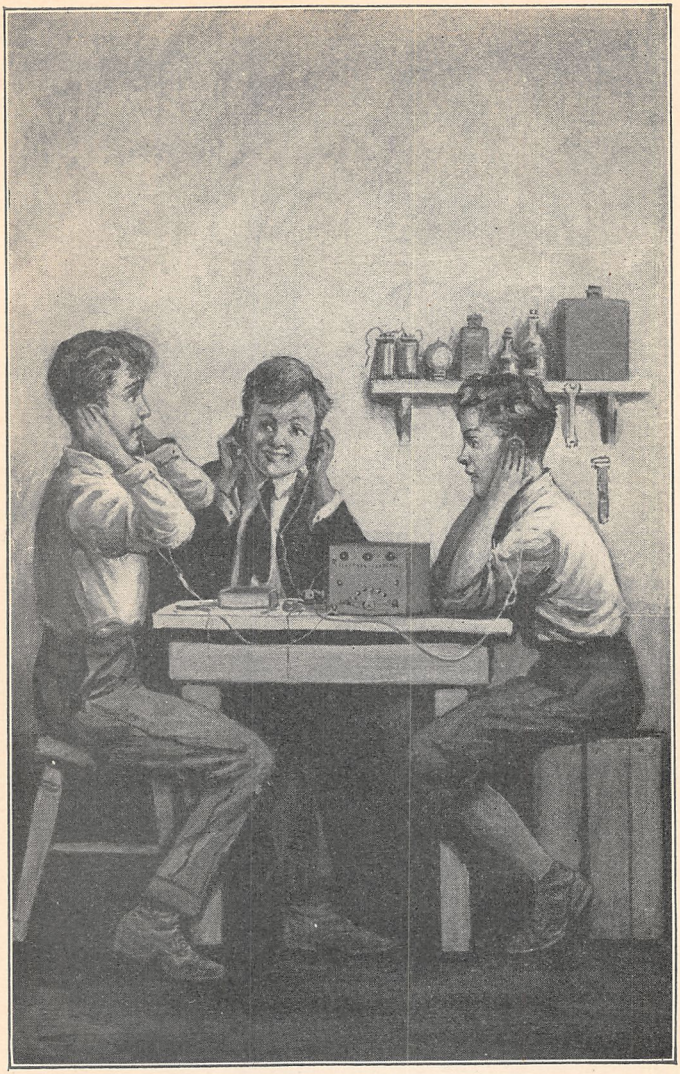
THE RADIO BOYS' FIRST WIRELESS



ALLEN CHAPMAN

To Johnny
From Mother
Xmas 1921

THE RADIO BOYS' FIRST WIRELESS



"THERE IT IS!" CRIED JOE, AS THE MUSIC SUDDENLY BURST UPON THEIR EARS

THE RADIO BOYS SERIES
(Trademark Registered)

THE RADIO BOYS' FIRST WIRELESS

OR

WINNING THE FERBERTON PRIZE

BY

ALLEN CHAPMAN
AUTHOR OF
THE RADIO BOYS AT OCEAN POINT
THE RADIO BOYS AT THE SENDING STATION
RALPH OF THE ROUNDHOUSE
RALPH ON THE OVERLAND EXPRESS, ETC.

WITH FOREWORD BY
JACK BINNS

ILLUSTRATED

NEW YORK
GROSSET & DUNLAP
PUBLISHERS

Made in the United States of America

BOOKS FOR BOYS

By Allen Chapman

12mo. Cloth. Illustrated.

THE RADIO BOYS SERIES

(Trademark Registered)

THE RADIO BOYS' FIRST WIRELESS
Or Winning the Ferberton Prize
THE RADIO BOYS AT OCEAN POINT
Or The Message that Saved the Ship
THE RADIO BOYS AT THE SENDING STATION
Or Making Good in the Wireless Room
THE RADIO BOYS AT MOUNTAIN PASS
Or The Midnight Call for Assistance
THE RADIO BOYS TRAILING A VOICE
Or Solving a Wireless Mystery

THE RAILROAD SERIES

RALPH OF THE ROUNDHOUSE
Or Bound to Become a Railroad Man
RALPH IN THE SWITCH TOWER
Or Clearing the Track
RALPH ON THE ENGINE
Or The Young Fireman of the Limited Mail
RALPH ON THE OVERLAND EXPRESS
Or The Trials and Triumphs of a Young Engineer
RALPH THE TRAIN DESPATCHER
Or The Mystery of the Pay Car
RALPH ON THE ARMY TRAIN
Or The Young Railroader's Most Daring Exploit

GROSSET & DUNLAP, Publishers, New York

COPYRIGHT, 1922, BY
GROSSET & DUNLAP

The Radio Boys' First Wireless

PUBLISHED APRIL, 1922

FOREWORD

By Jack Binns

It is very appropriate at this moment when radio has taken the country by storm, and aroused an enthusiasm never before equaled, that the possibilities for boys in this art should be brought out in the interesting and readable manner shown in the first book of this series.

Radio is still a young science, and some of the most remarkable advances in it have been contributed by amateurs—that is, by boy experimenters. It is never too late to start in the fascinating game, and the reward for the successful experimenter is rich both in honor and recompense.

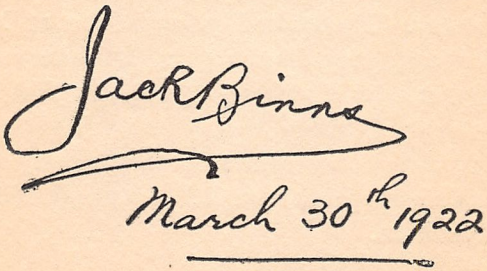
Just take the case of E. H. Armstrong, one of the most famous of all the amateurs in this country. He started in as a boy at home, in Yonkers, experimenting with home-made apparatus, and discovered the circuit that has revolutionized radio transmission and reception. His circuit has made it possible to broadcast music and speech, and it has brought him world-wide fame.

He had no elaborate laboratory in which to experiment, but he persevered and won out. Like the Radio Boys in this story, he was confronted with all kinds of odds, but with true American spirit he stuck to his task and triumphed.

The attitude of the government toward the wireless amateur is well illustrated by the expressions of Secretary of Commerce Herbert Hoover, and is summed up in his declaration, "I am for the American boy."

No other country in the world offers such opportunities to boy experimenters in the radio field. The government realizes that there is always a possibility of other important discoveries being made by the boy experimenters, and that is the reason it encourages the amateur.

Don't be discouraged because Edison came before you. There is still plenty of opportunity for you to become a new Edison, and no science offers the possibilities in this respect as does radio communication.



CONTENTS

CHAPTER		PAGE
I.	The Auto Crash	9
II.	Taking Chances	18
III.	Wonders of Wireless	28
IV.	Mysterious Forces	36
V.	Crooked Work	44
VI.	A Practical Object Lesson	55
VII.	In the Dark	62
VIII.	Getting a Start	70
IX.	Work and Fun	79
X.	A Stealthy Rascal	85
XI.	Clever Thinking	91
XII.	Forging Ahead	97
XIII.	Thrashing a Bully	108
XIV.	On the Verge	116
XV.	The Finishing Touch	127
XVI.	Sweets of Victory	131
XVII.	The Ferberton Prize	142
XVIII.	Friendly Rivals	151
XIX.	A Splendid Inspiration	156
XX.	The Time of Their Lives	166

CHAPTER		PAGE
XXI.	The Voice That Stuttered	179
XXII.	The Stolen Set	187
XXIII.	Battering in the Door	191
XXIV.	On the Trail	195
XXV.	The Prize	204

THE RADIO BOYS' FIRST WIRELESS

CHAPTER I

THE AUTO CRASH

"How about it, Joe?" asked Bob Layton of his chum, Joe Atwood, as they came out of school one afternoon, swinging their books by straps over their shoulders. "Going up to Dr. Dale's house to-night?"

"You bet I am," replied Joe enthusiastically. "I wouldn't miss it for a farm. I'm keen to know more about this wireless business, and I'm sure the doctor can tell us more about it than any one else."

"He sure does get a fellow interested," agreed Bob. "He isn't a bit preachy about it, either. Just talks to you in words you can understand. But all the time you know he's got a lot back of it and could tell you ten times as much about it if you asked him. Makes you feel safe when you listen to him. Not a bit of guesswork or anything like that."

"What are you fellows chinning about?" asked Jimmy Plummer, one of their schoolmates, who came up to them at that moment. "You seem all worked up about something."

"It's about that talk Dr. Dale is going to give us to-night on the wireless telephone," answered Bob, as he edged over a little to give Jimmy room to walk beside them. "You're going, aren't you? The doctor said he wanted all the boys to come who could."

"Do you suppose there'll be any eats?" asked Jimmy, who was round and fat, and who went by the nickname of "Doughnuts" among his mates because of his fondness for that special delicacy.

"Always thinking of that precious stomach of yours!" laughed Bob. "Jimmy, I'm ashamed of you. You're getting so fat now that pretty soon you won't have to walk to school. You can just roll there like a barrel."

"You string beans are only jealous because I get more fun out of eating than you do," declared Jimmy, with a grin. "But eats or no eats, I'm going to hear what the doctor has to say. I got a letter the other day from a cousin of mine out in Michigan, and he told me all about a set that he'd made and put up himself. Said he was just crazy about it. Wanted me to go into it so that he and I might talk together. Of course, though,

I guess he was just kidding me about that. Michigan's a long way off, and it takes more than a day to get there on a train."

"Distance doesn't make much difference," declared Bob. "Already they've talked across the Atlantic Ocean."

"Not amateurs?" objected Joe incredulously.

"Yes, even amateurs," affirmed Bob. "My dad was reading in the papers the other night about a man in New Jersey who was talking to a friend near by and told him that he was going to play a phonograph record for him. A man over in Scotland, over three thousand miles away, heard every word he said and heard the music of the phonograph too. A ship two thousand miles out on the Atlantic heard the same record, and so did another ship in a harbor in Central America. Of course, the paper said, that was only a freak, and amateur sets couldn't do that once in a million times. But it did it that time, all right. I tell you, fellows, that wireless telephone is a wonder. Talk about the stories of the Arabian Nights! They aren't in it."

There was a loud guffaw behind the lads, accompanied by snickers, and the friends turned around to see three boys following them.

One of them, who was apparently the leader of the trio, was a big, unwieldy boy of sixteen, a year older and considerably larger than Bob and

Joe. His eyes were close together, and he had a look of coarseness and arrogance that denoted the bully. Buck Looker, as he was called—his first name was Buckley—was generally unpopular among the boys, but as he was the son of one of the richest men of the town he usually had one or two cronies who hung about him for what they could get. One of these, Carl Lutz, an unwholesome looking boy, somewhat younger than Buck, was walking beside him, and on the side nearer the curb was Terry Mooney, the youngest of the three, a boy whose furtive eyes carried in them a suggestion of treachery and sneakiness.

"What's the joke, Buck?" asked Bob coldly, as he looked from one to the other of the sniggering faces.

"You're the joke," answered Buck insolently; "that is, if you believe all that stuff I heard you pulling off just now. You must be easy if you fall for that."

"I wasn't talking to you," replied Bob, restraining himself with some difficulty. "But since you've butted in, perhaps you'll tell me just what it is that's so funny about the wireless telephone."

"The whole thing is bunk, if you ask me," replied Buck with the confidence that so often goes with ignorance. "Telephoning without wires! You might as well talk of walking without legs."

This argument seemed to him so overpowering

that he swelled out his chest and looked triumphantly at his two companions, whose faces instantly took on the same expression.

"You made a ten strike that time, Buck," declared Lutz, clapping him on the shoulder.

"Hit the target right in the bull's-eye," chimed in Terry, with a smirk.

Bob and Joe and Jimmy looked at each other, and, despite their resentment, had all they could do to keep from breaking into laughter.

Buck noticed their amused expression, and his coarse face grew red and mottled.

"Well," he demanded, "what have you got to say to that? Am I right or ain't I?"

"You're wrong," replied Joe promptly. "Dead wrong. You're so far from the truth that you couldn't see it with a telescope. You're talking like a ham sandwich."

"Look out what you're saying, Joe Atwood, or I'll make you sorry for it," threatened Buck, as he clinched his fist, an ugly look coming into his eyes.

"I apologize," said Joe. "That is, I apologize to the ham sandwich."

Bob laid a restraining hand on his friend's arm.

"Easy, Joe," he counseled. "Listen, Buck," he went on. "Did you ever hear of Marconi?"

"Sure, I did," replied Buck. "He's the fellow

that had the fight with Julius Cæsar. The one that Cleopatra was dippy about."

"No," said Bob patiently. "You're thinking of Mark Antony. He's been dead for more than eighteen hundred years. The man I mean is a very live one. He's the inventor of wireless telegraphy."

"Never heard of him," muttered Buck sullenly.

"Well, since you never heard of him, we'll mention some one else," continued Bob. "I was only going to say that he's a pretty brainy fellow, and he believes in the wireless telephone. Then there's Edison. Perhaps you've heard of him?"

"Of course I have," blurted Buck furiously. "Say, what are you trying to do? Make a fool of me?"

"Nature's done that already," Joe put in, but Bob checked him.

"I'm simply trying to show," Bob explained, "that if we're 'easy,' as you call it, in 'falling for that stuff,' there are a lot of able men in the United States who are in the same boat with us. In fact there isn't a man of brains and education in the country who doesn't believe in it."

"Do you mean to say that I haven't any brains?" cried Buck in a fury.

"Not exactly that," replied Bob. "But per-

haps you don't use what brains you have. That happens sometimes, you know."

"I guess a fellow's got a right to his own opinions," blustered Carl Lutz, coming to the rescue of his discomfited leader.

"Of course he has," retorted Joe. "But when it's that kind of opinion he ought to put on the soft pedal. Any one has a right to have a club foot or a hunched back or cross eyes, but he doesn't usually go round boasting of them."

"You're a wise bunch, I'll tell the world," sneered Buck in lieu of a more stinging retort.

"Not at all," replied Joe. "It's you that claim to be wiser than Edison and the rest of them. But you mustn't think because you have water on the brain that you're the whole ocean."

The air was full of electricity and matters were tense between the two groups when a diversion came in the form of a halloo from the other side of the street, and Herb Fennington, a special friend of Bob and Joe, came running over to greet them. They stopped for a moment, and Buck and his cronies passed on, favoring Bob, Joe and Jimmy with malignant scowls as they did so.

"Hello, Herb!" called Bob, as the latter came up to them, a little breathless from running.

"Hello, fellows!" returned Herb, as he looked

after Buck and his companions. "What's up with Buck and his gang? Looked as if there was going to be a fight about something."

"Not so bad as that, I guess," replied Bob, with a laugh, "though Buck did look as though he'd like to take a swing at us."

"I only wish he had," grunted Joe. "That fellow certainly gets me mad, and I wouldn't mind at all having some excuse for pitching into him."

"What was it all about?" asked Herb, with lively curiosity.

"He heard us talking about the wireless telephone and butted in," explained Bob. "Practically told us we were fools for believing that there is such a thing."

Herb laughed outright.

"Sounds like Buck," he commented. "What he doesn't know would fill a book."

"A whole library you mean," corrected Joe.

"A library then," agreed Herb, as the boys resumed their walk, which had now brought them close to the business part of the town. "But say, fellows, forget about Buck and listen to this. It's a good one that I heard yesterday. Why is——"

He was interrupted by a shout from Bob.

"Look," he cried, "look at that auto! It's running wild!"

Their startled eyes followed the direction of Bob's pointing finger.

An automobile was describing curious antics in the middle of the street. It made short dashes here and there, hesitated, zigzagged. Then it turned suddenly toward the curb, dashed on the sidewalk and amid a crash of broken glass plunged through the plate glass windows of a store.

CHAPTER II

TAKING CHANCES

THERE was a moment of stupefaction on the part of the boys at the suddenness of what promised to be a tragedy. Then in a flash they came to life.

"There was a girl in that auto!" cried Bob, as he dashed toward the store, the others following close on his heels. "Hurry up, fellows. She may be badly hurt."

"More likely killed," muttered Joe. "Don't see how any one could live through that."

The store through whose windows the car had dashed was the largest paint and hardware store in the town. The crash had resounded far and near, and people were rushing toward it from all directions. The boys reached the place first, however. They opened the door and raced in, only to be greeted with a heavy volume of smoke, through which flickered tongues of fire.

In the midst of a mass of débris was standing the wrecked auto. The gasoline tank had been

smashed by the impact, and the contents, luckily a small amount, had been scattered over the place and come in contact with a stove. The flames had spread to a large part of the paints and oils and other inflammable materials that the store contained. One of the clerks in the place had been hit and stunned by the car, while two others, together with the proprietor and a customer, were making desperate attempts to beat out the flames.

Bob's quick eye caught sight of a case of hand grenades standing near the entrance, and his qualities of leadership came into play at once.

"Grab those grenades, you, Herb, and, you, Jimmy," he cried, "and throw them where they're most needed. Come with me, Joe, and get that girl out of the car. Quick!"

In a twinkling, Herb and Jimmy were hurling the grenades at the points where the fire seemed to have gained most headway, while Bob and Joe worked their way over the mass of boxes and wrecked fixtures to the place where the runaway automobile had ended its mad rush.

The plate glass windows had reached almost to the ground, so that the automobile with its great momentum had easily surmounted the sills and reached nearly the middle of the store. One wheel had been torn off, the windshield was shattered into fragments, and the front of the machine had been crushed in.

In the driver's seat, still with her hand on the wheel, was the figure of a girl. No sound came from her, and from the way her body drooped forward, limp and motionless, it was evident that she was either unconscious or dead. The boys feared the worst, especially when they saw a stream of blood trickling down from a wound near her temple.

They worked at top speed, trying to reach her and draw her out from the driver's seat. But the bent and tangled mass of wreckage held her captive, and it was only after other willing hands had come to their assistance that they were able to lift her from the car.

They bore her to a point just outside the door, and laid her on some boxes that were hurriedly placed side by side. Her eyes were closed and she was deadly pale, the whiteness of her face being accentuated by the blood that dripped from her wound. She was a young girl, apparently no more than twenty, and was quietly though tastefully dressed. It was evident that she still breathed, and a slight fluttering of the eyelids indicated that she was returning to consciousness.

Directly across the street was the Sterling House, named after its proprietor, and Mrs. Sterling, a motherly looking woman, who was among those who crowded around to look and help, recognized the girl at once.

"Why, she's one of our guests!" she exclaimed. "Her name is Berwick—Miss Nellie Berwick—and she's been staying with us for the last three days. Some of you bring her across to her room, and some one else hurry and get a doctor. Oh, there's Dr. Ellis now!" she exclaimed with great relief, as she descried a tall figure in the crowd hurrying to the side of the injured girl.

Under the doctor's directions, Bob and Joe, assisted by two others, lifted the girl and carried her across to the hotel. And while they are engaged in this work of helpfulness, it may be well for a better understanding of our story to sketch briefly the careers of Bob and Joe and their friends and the surroundings in which they had been brought up.

Bob Layton was the son of Henry Layton, the leading druggist and chemist of the town. Bob had been born and brought up in Clintonia, which was a thriving town of about ten thousand inhabitants in an Eastern state, about seventy-five miles from New York City. It was located on the Shagary river, a stream that afforded abundant opportunities for boating, fishing, and swimming, and was a source of endless pastime and recreation for the boys.

Bob, at the time this story opens, was fifteen years old, of rather dark complexion, and was tall and well-developed for his age. He was vigor-

ous and athletic and a lover of outdoor sports. His magnetism and vitality made him a "live wire," and he was the natural leader among the boys with whom he associated. His nature was frank and friendly, and he was extremely popular with all those who were worth while. With that he had a quick temper, which he had learned, however, to keep under control. He never looked for trouble, but at the same time he never side-stepped it, and any one who tried to bulldoze and impose on him speedily found that he had picked out the wrong person.

Joe Atwood, Bob's special chum, was a boy of about the same age and was the son of Dr. Atwood, a prominent and respected physician of the town. Between him and Bob a warm friendship existed, and where one was found the other was certain to be not very far off. He had a fair complexion with merry blue eyes, that, however, could flash fire on occasion. As has already been seen in his interchanges with Buck Looker, he had a "quick trigger" tongue, and was likely to say a thing first and regret it afterward, because he had gone perhaps too far. Bob, as the more self controlled of the chums, served as a sort of check on the impulsiveness of his friend, and had many times kept him out of trouble. Joe shared Bob's fondness for athletic sports, and, like him, was

a leading spirit in the baseball and football teams of the town.

Another thing that drew the boys together was their keen interest in anything pertaining to science. Each had marked mechanical ability, and would at any time rather put a contrivance together by their own efforts than to have it bought for them ready made. It was this quality that had made them enthusiastic regarding the wonders of the wireless telephone.

Herbert Fennington was a year younger than the others and the son of one of the principal merchants of Clintonia. He was lively, full of fun and jokes and an all-around "good fellow."

Jimmy Plummer was fourteen, round, fat, lazy, and good-natured, and a great lover of the good things of life. His father was a carpenter, thrifty, respected and a good citizen.

As the boys all lived on West Main Street, a pleasant, shaded street about a quarter of a mile from the business center of the town, and within a few doors of each other, they were naturally thrown much together both in the daytime and when in the evenings they foregathered at each other's homes to study together the lessons for the next day or to indulge in a few hours of fun and recreation.

The boys reached the hotel with their helpless

burden and carried the girl upstairs to her room, where Mrs. Sterling had everything in readiness for her reception. Then the doctor took her in hand and the boys withdrew to the lobby of the hotel, where they planned to wait for a few minutes until the results of the doctor's examination could become known.

Now for the first time since the excitement began they had time to think of themselves, and when they looked at each other they could hardly forbear from laughing outright at the picture they presented. They were begrimed with smoke and grease, their clothes were rumpled and soiled, and Bob's sleeve had been split from shoulder to elbow, where it had been caught by a jagged strip of the material of the wrecked car.

"You look like a stoker from the hold of an ocean steamer," gibed Joe, as he looked at the unkempt figure of his friend.

"It's dollars to doughnuts that you look just as bad," responded Bob, with a grin, as he made a break for the washroom, followed by his chum.

In the work of washing themselves, they found that it was not only their clothes and appearance that had suffered. Each had a number of scratches and blisters that they had not felt during the stirring period of rescue but that now made their presence known. But these, after all,

were trifles, and they took them as simply a part of the day's work.

They had only a few minutes to wait before the tall figure of the doctor emerged from the sick room and descended the stairs. The expression on his face reassured them, as they hurried forward to hear his verdict.

"There's no danger," he declared, as soon as he came within speaking distance, "though how she got off as easily as she did is almost a miracle. The crushed front and top of the machine acted as a sort of protection for her. The cut on the side of the face must have been made by a splinter of flying glass from the windshield. What she is suffering principally from is shock, and that's no wonder. Even one of you rough and ready youngsters," he added with a smile, "would find it a shock to go flying through a plate glass window."

"Sure thing," said Bob in reply. "I'm mighty glad to know that things aren't any worse with her. I didn't think when we rushed in that we'd find her alive at all."

"You boys deserve great credit for the quickness and decision with which you acted," the doctor said gravely. "The fire might have reached her in a few seconds more. I'm told that the auto caught fire just after you got her out.

"By the way," he added, as he started to leave

the hotel, "she has been told of the way you rescued her, and she is very grateful. She wanted me to let you come in so that she could thank you in person, but in her present weakened state I didn't think it advisable. I told her, though, that I would speak to you about it, and that if you so desired you could call on her tomorrow."

"We'll be glad to," answered Bob, and Joe nodded his assent as the doctor with a wave of the hand went down the steps.

The boys followed him a moment later and went across the street to view the scene of the wreck. The fire had been put out, and the local fire company, which had been summoned to the scene, was rolling up the hose and getting ready to depart. The proprietor and clerks of the store, with the aid of volunteers, had drawn the wreck of the partly burned automobile from the store, and it stood in the street, a melancholy ruin. It was clear that as an auto its day of usefulness was over.

A large crowd still lingered about the spot, discussing the accident, which by its unique features had thoroughly stirred up the town. It was not often that an auto took a flying leap into a store and the story of why and how it happened was sure to furnish a topic of discussion for many days to come.

Bob and Joe, as two of the principal figures in the event, were surrounded at once and besieged with questions. Many were the commendations also that were showered upon them for their courage and presence of mind.

"Oh, that wasn't much," protested Bob. "We just happened to be close at hand when the auto went crazy. Anybody else would have done the same."

"Of course they would," broke in Buck Looker, who with his cronies was standing close by. "People are making an awful fuss about a little thing, it seems to me. How about the work we did in helping to put out the fire?"

"Did you?" asked Jimmy Plummer. "That's news to me. Look at your hands and clothes. They haven't got a mark on them. I saw you standing around outside, and you didn't lift a finger."

"You keep your mouth shut or I'll shut it for you," cried Buck angrily. "You're getting altogether too fresh."

Jimmy was about to retort, but just then there came an interruption.

CHAPTER III

WONDERS OF WIRELESS

"How are you, boys?" asked a pleasant voice, and the lads looked up to see Dr. Amory Dale, the pastor of the "Old First Church" of Clintonia, standing beside them.

Most of them responded cordially, for they liked and respected him. There was no stiffness or professionalism about him to make them feel that they were being held at a distance. He was comparatively young, somewhere in the early thirties, and had the frame and bearing of an athlete. There were rumors that he had been a star pitcher on his college baseball nine and a quarterback on a football eleven whose exploits were still cherished in the memory of his institution. He was a lover of the out-of-doors and there was a breeziness and vitality that radiated from him and made him welcome wherever he went. He kept in touch with modern science, and it was said that he would have embraced a scientific career if he had not felt it his duty to enter the pulpit.

"You boys seem to have had a strenuous time of it," he said, as he looked with an amused smile at the torn and soiled clothes of Bob and Joe as well as the scratches and blisters that marked them. "I hear that you covered yourself with glory. Tell me more about it."

They went into all the details they knew, passing over as rapidly as possible their own part in the affair, and Dr. Dale listened attentively.

"Good work," he commented. "The occasion came and you were equal to it, and that's all that can be asked of anybody. I think I'll step over to the Sterling House now and see if I can be of any help to the poor girl who has had such a trying experience. By the way, boys, I hope you won't forget about that wireless talk up at my house to-night. I'm looking for you all to come if possible, and I'll do my best to see that you have a good time."

"We're sure of that," replied Bob, with a smile. "And we haven't been thinking of much else since you first asked us to come. In fact, we were talking about it just before the accident."

"That's good," replied the doctor. "You coming too, Buckley?" he asked, turning to Buck, who with his cronies was standing grouchily a little apart from the others.

Buck stammered something which could be hardly understood, but which was interpreted by

the doctor as a negative. The minister did not press the matter, but with a pleasant wave of the hand that included them all he went across the street.

"He's a brick, isn't he?" remarked Bob, as he looked after him.

"You bet he is," agreed Joe emphatically.

"All wool and a yard wide," was Herb's tribute, as the boys, having gathered up their books, which in the excitement had been thrown wherever they happened to fall, resumed their walk toward their homes, leaving Buck and his mates glowering after them.

There was no lack of animated conversation around their supper tables that night. Bob's parents made no secret of the fact that they were proud of their son's part in the day's work. Joe, too, found himself made much of in the family circle, not only by his father and mother, but by his sister Rose, who hovered about him forestalling his wants and showing him a deference that would have been highly flattering if it had not been also somewhat embarrassing. Rose, a year or so younger than Joe, was all aflutter with the romantic possibilities of the affair. A young girl in distress! Joe to the rescue! What could be more interesting?

"Was she pretty, Joe?" she asked.

"Blest if I know," her brother answered briefly.

"Pass me some more of that roast veal, Sis. It goes right to the spot."

With a sigh, Rose complied. Joe was so practical!

Herb and Jimmy came in for a modified share of applause because of the help they had rendered by their prompt and efficient handling of the fire grenades, which had held the flames under control until the fire department could get to the place and complete the job.

The minister's house adjoined the big stone church, which was on West Main Street and divided the business from the residential part of the street. It was a roomy, capacious structure, and at about eight o'clock that night it became a place of pilgrimage for a large number of the boys of the town. Buck Looker and his cronies were conspicuous by their absence, but this was a relief rather than a privation.

Bob and his friends were among the first comers. They were warmly greeted by Dr. Dale and ushered into the large living room of the parsonage. The portières had been drawn back between the front and back rooms so that nearly the whole ground floor was thrown into one big room. Extra chairs had been brought in so that there were accommodations for a large number. There were no grown people in the gathering, for the doctor had especially confined his invitation to

the boys, who, he knew, would feel more at ease in the absence of their elders.

"There's Talley's wagon," remarked Jimmy, as he noted the presence at the curb of a vehicle bearing the name of the leading caterer of the town. "I'll bet we're going to have some eats."

"And you've just come from the supper table!" exclaimed Bob.

"He's like a trolley car," chaffed Joe. "You can always crowd more into it."

"Don't you know the doctor's going to give you a feast of reason?" asked Herb with mock gravity.

"Reason's all right," admitted Jimmy, "but there isn't much nourishment in it."

"How about a flow of soul?" asked Bob.

"Nothing against it," Jimmy answered, "but a flow of lemonade has its good points too."

From the time the boys entered the room their eyes were fixed on a box-like contrivance that was placed on a table close up against the wall of the further room. It had a number of polished knobs and dials and several groups of wires that seemed to lead in or out of the instrument. Connected with it was a horn such as was common enough in the early days of the phonograph. There were also several pairs of what looked like telephone ear pieces lying on the table.

They eyed it with intense curiosity, not un-

mixed with awe. They had already heard and read enough of the wireless telephone to realize that it was one of the greatest marvels of modern times. It seemed almost like something magical, something which, like the lamp of Aladdin, could summon genii who would be obedient to the call.

The rooms were comfortably filled when Dr. Dale, with a genial smile, rose and took up his stand near the table.

"Now, boys," he said, "I've asked you to come here to-night so that we can talk together and get a little better idea of some of the wonders of the world we are living in. One of those wonders and perhaps the most wonderful of all is the wireless telephone," and here he laid his hand on the box beside him. "Most of you have heard of it and want to learn more about it. I'm going to try to explain it to you just as simply as I possibly can. And I'm not going to do all the talking either, for I want you to feel free to ask any questions you like. And before I do any talking worth mentioning, I'm going to give you a little idea of what the wireless telephone can do."

The boys watched him breathlessly as he handled two of the knobs at the side of the box. A moment later they heard the clear, vibrant notes of a violin playing a beautiful selection from one of the operas. The music rose and swelled in wonderful sweetness until it filled the room

with the delicious melody and held all the hearers entranced under its spell. It was evident that only the hand of a master could draw such exquisite music from the instrument.

The doctor waited until the last notes had died away, and smiled with gratification as he saw the rapt look on the faces of his visitors.

"Sounds as if it were in the next room, doesn't it?" he asked. "But that music came from Newark, New Jersey."

"Gee," whispered Jimmy to Bob, alongside whom he was sitting, "that's nearly a hundred miles from here."

"But there's no need of confining ourselves to any place as near as that," continued the doctor. "What do you say to listening in on Pittsburg? That's only a trifle of four hundred miles or so from here."

"He calls four hundred miles a trifle!" breathed Jimmy. "Pinch me, somebody. I must be dreaming."

Joe on his other side pinched him so sharply that Jimmy almost jumped from his chair.

"Lay off there," he murmured indignantly.

"S-sh," cautioned Bob, for by this time the doctor had made another adjustment.

Then into the room burst the stirring strains of the "Stars and Stripes Forever" played by a band that had a national reputation. The rhythm

and dash and fire of the performance were such that the boys had all they could do to keep their seats, and, as it was, their feet half unconsciously beat time to the music.

"Hit you hard, did it?" smiled Dr. Dale, who, to tell the truth, had been keeping time himself. "Well, I don't wonder. I'd hate to see the time when music like that wouldn't shake you up. But now we'll go a few hundred miles farther and see what Detroit has to give us."

Jimmy was past speech by this time and could only look at his comrades in helpless wonder.

Then the twang of a banjo sounded through the rooms and to the thrumming of the strings came a voice in rich negro dialect:

"It rained all night the day I left,
The next day it was dry,
The sun so hot I froze to death
Susanna, don't you cry."

CHAPTER IV

MYSTERIOUS FORCES

THE boys broke out in roars of laughter in which the doctor joined heartily.

"You see how it is," he said, as the song came to an end. "There's hardly anything you can think of that you can't hear over the wireless telephone. It takes you anywhere you want to go in a fraction of a second. In the last few minutes, we've covered quite a section of the United States, and with a still stronger instrument we could go right out to the Pacific coast and hear the barking of the sea lions at the Golden Gate."

"Wonder if we could hear the barking of the hot dogs at Coney Island," whispered the irrepressible Herb, who would have his joke.

Bob nudged him sharply and Herb subsided.

"And you can pick out any kind of entertainment you want," the doctor went on. "The great stations from which this music was sent out have programs which are published every day, to-

gether with the exact time that the selections will be given. At a given minute you can make your adjustment and listen to a violin solo, a band concert, a political speech, a sermon, or anything else that you want. If it doesn't please you, you can shut it off at once, which is much easier and pleasanter than getting up and going out from an audience.

"We'll have some more selections later on in the evening," he continued, "but now I want to explain to you how this thing is done. I can't hope to do much more than touch the surface of the subject to-night, for I don't want to tire you out, and there'll be plenty of other nights and days when I hope you boys will call upon me for any information that you want and I can give.

"Of course the whole thing is based on electricity, the most wonderful thing that perhaps there is in the whole physical world. Nobody knows what electricity is—Mr. Edison himself doesn't know. We only know that it is a wonderful fluid and that the ether is full of it. But though we don't know what it is, scientific men have learned how to develop and use its energy, and among other things they have harnessed it in the service of the wireless telephone.

"Take for instance a quiet lake. It may seem absolutely still, but if you throw a stone in it you start a number of ripples that keep spreading

further and further out until they break on the shore. So if you hit a drum with a stick, sound waves are stirred up that keep spreading out very much like the ripples on the lake.

"Now electricity is something like that. It doesn't begin to act until you do something to it. The impulse to ripple is in the quiet lake all the time, but it doesn't ripple until you throw the stone in it. The sound quality is in the drum, but you don't hear it until you hit the drum with a stick. So you've got to put into the ether something that disturbs the electricity in it, something that stirs it up, and then this disturbance makes waves that travel on, just as the waves on the lake follow one another and just as the sound waves from the drum keep pushing each other along.

"A man named Hertz discovered a way of stirring up this energy, snapping it, you might say, as a man snaps a whip. It was found that these waves could be made long enough and strong enough to go all the way across the Atlantic Ocean, in fact to go around the world.

"Around the world!" murmured Jimmy, and again he was tempted to ask somebody to pinch him, but remembered his previous experience and stopped just in time.

"Now," continued the doctor, "you may ask what this has to do with the voice, for it is with

the voice that one talks over the 'phone. The whole principle of the wireless telephone is based on the fact that sound can be transformed into electricity and then can be transformed back into sound again. I know," he said, with a smile, "that that sounds very much like saying that you can make eggs into an omelet and then get the omelet back into separate eggs again"—here there was an audible snicker from the boys—"but that is very much like what is done by the wireless, although it doesn't exactly fit the case.

"Now see what a wonderful increase in power you get the moment the sound waves are changed into electric waves. Sound goes at the rate of one thousand and ninety feet a second. Electrical energy travels at the rate of one hundred and eight-six thousand miles a second. In other words it could go around the world more than seven times in a single second.

"When you speak into a telephone, unless you are greatly excited, you don't use more than a fiftieth part of the power of your voice. But by the time that sound has been caught up and churned, as it were, into electrical energy it is more than a hundred thousand times as loud and strong.

"Suppose now, just as an illustration, that you were going to telephone to Europe. You'd pick up the 'phone and give your message. That

sound would go in the form of a tiny electrical impulse into one of the great sending stations on the Atlantic Coast, we'll say, and there it would be caught up by a powerful lot of electrical machines, amplifiers, alternators, and others, that would keep making it stronger and stronger until finally it was flung out into space from the ends of the great wires or antennae. Out and out it would go until it struck a lot of wires on the other side of the ocean. Then it would go through another process that would gradually change the electrical impulse back into sound again, and the man at the other end of the telephone would hear your voice, just as one does now when you 'phone to any one in this town."

He paused for a moment, and there was a long drawn breath on the part of his auditors that testified to the rapt attention with which they had followed him into this fairyland of science.

"So much for the theory and principle of the wireless," resumed the doctor. "Of course I've only scratched the surface, and if I talked to you all night there'd be still lots left to say. But we only need to know a little about it to put it to practical use. And it is the practical use of the wireless telephone that I'm especially interested in for the sake of you boys. I'm satisfied that there's hardly anything that could give you more pleasure or more benefit than for each of you to have

one of these contrivances in your own home. It's a wonderful educator, it helps to develop your interest in science, and what will perhaps appeal to you most of all, you can have more fun with it than anything else I know of."

Here Bob put in a question that was in the minds of many of the others.

"Does it cost very much, Doctor?" he asked.

"Not very much," the doctor replied. "Of course, some of the more powerful ones with vacuum tubes and other high class improvements run into the hundreds of dollars. But some very good receiving sets—and that's all you could use at the start, for it takes considerable time and you have to get a license before you are permitted to transmit—can be bought for from twenty-five to seventy-five dollars."

There was a little gasp at this, some of which was due to a feeling of disappointment. It seemed beyond the range of what they could save up from their pocket money, and while the parents of some of them were well to do, others came from simple and frugal homes where every dollar had to be carefully counted.

The doctor was quick to note the expression on many faces, and took pains at once to remove any feeling of discouragement.

"But don't let that bother you at all," he said, "for with a little thought and planning any one

of you will be able to build a telephone receiving set for himself at hardly any cost at all. In fact, I'd much rather have you build one than buy one, for in that way you'll get an understanding of the whole thing that otherwise you might not get at all. You'd be surprised perhaps if I told you that this set here was built by me and I wouldn't exchange the experience I've had in putting it together for a good deal of money."

"But you knew how to do it," put in Joe, "while we don't know the first thing about it. We wouldn't know how to start, even, let alone finish one."

"I was coming to that," returned Dr. Dale, smiling. "As some of you know, I've fitted up a workshop in the barn behind this house where I do a good deal of tinkering in my spare hours. Now I'm going to ask you boys to come out there next Saturday and see me build a wireless receiving set from A to Z. You'll be surprised to see how much can be done with a few things that cost very little money and with a lot of things that don't cost any money at all. How about it, boys?"

It was almost with a whoop that the invitation was accepted by his eager hearers, and the minister smiled with gratification at their enthusiasm.

"Now that's all the talking I'm going to do to-night," he said. "And as talking's rather dry

work, I'm going to have a little refreshment. Will you boys join me?"

Would they join him? They would and they did, and the havoc they wrought on the sandwiches and cake and ice-cream that were brought in and passed around was something to be remembered. Jimmy in particular ate until his eyes bulged and fully sustained his previous reputation. And while they ate, the doctor turned on one lively selection after another, finishing with a selection from a jazz band that sent them into a frenzy of laughter.

They were still tingling with it as they finally said good-night to the doctor and started on their way home.

"Oh, you wireless telephone!" exclaimed Herb.

"Isn't it a wonder?" ejaculated Joe.

"Wonder!" repeated Bob. "It's a miracle!"

CHAPTER V

CROOKED WORK

"We've got to get busy right away and rig up wireless telephones of our own," continued Bob. "Of course they won't be anything like the doctor's, but they ought to be good enough for us to get a lot of fun out of them."

"You bet we will," agreed Joe. "Gee, I can't wait to get at it! If it wasn't so late I believe I'd start in figuring on it to-night."

"Count me in on it too," chimed in Jimmy. "In a week or so we'll be sending messages everywhere. I'll be talking maybe to that cousin of mine in Michigan."

"Come out of your trance, Jimmy," laughed Bob, clapping him on the shoulder. "Things don't move so fast as that. It'll be a good long time before you'll be sending any messages. You'll have to learn all about receiving them first; and believe me there's a good deal to learn about that. Then before you can send any messages you have to pass an examination and get a li-

cense. But for quite a time we'll have our hands full and our ears full with attending to the receiving end of the game. One step at a time is the rule in radio, as well as in anything else that's worth while."

"I didn't know that," replied Jimmy, somewhat dashed by the information. "I had an idea that we could send just as soon as we got our sets made."

"How about you, Herb?" asked Bob. "You're in it with the rest of us too, aren't you?"

"With both feet," replied Herb. "I think that the wireless is the greatest thing that ever happened. But I don't know about making one for myself. I'm all thumbs when it comes to doing any mechanical work. You fellows are handy with tools, but I have all I can do to keep out of my own way. I guess I'll ask my dad to buy me a set and let it go at that."

"That's what you think now," replied Joe, "but I'll bet when you see the rest of us getting busy, you'll pitch in too and make your own machine. Besides, from what the doctor says, it doesn't take a genius to put the thing together."

They separated for the night with their heads still full of the wonders they had heard and seen, and the enthusiasm was still with them when they woke the next morning.

At the breakfast tables the conversation was

divided between their experience of the night before and the newspaper account of the auto accident. A good deal of space was devoted to the latter, and it was gratifying to learn that although the damage to the store had been considerable the loss was covered by insurance and that the young lady whose automobile had crashed into the store had not been seriously injured and was expected to be around again in a few days. The coolness and courage with which Bob and Joe had acted and the part played by Herb and Jimmy in checking the spread of the flames were not overlooked. The comment that went with it was warm and appreciative, so much so in fact that, while the boys were not wholly displeased with it, they felt, as Joe expressed it, that the reporter was "spreading it on too thick" and feared that they would have to undergo no end of "joshing" from their mates.

Their lessons in school that day did not receive all the attention that was due them, for their minds were taken up pretty fully by the events of the last twenty-four hours. But three o'clock came at last, and with it came the reminder that they were to call on their way home at the Sterling House, in order to see Miss Berwick, in accordance with her request of the day before.

Bustling, motherly Mrs. Sterling greeted Bob

and Joe with a smile, as they made known their errand.

"So here are the young heroes that the paper has been making so much fuss about," she said mischievously, and Bob and Joe blushed to their ears. "Just wait a minute until I run up and see if Nellie is ready to receive you."

"If it's too late, we can wait until another day," said Bob.

"Oh, no," replied Mrs. Sterling. "She's been looking forward to your coming all day and has spoken about it a number of times. She is very anxious to thank you both, and I'm sure it will do her good to see you. The doctor was here this morning and said it would be all right. Of course, it won't do to stay too long, for the poor lamb is still rather nervous after her accident, and no wonder. Just wait here a minute."

She disappeared, but a moment later was at the head of the stairs motioning to them to come up.

They were ushered into a bright, sunny room, where they found Miss Berwick resting in an easy chair, propped up with pillows.

She was a pretty girl with blue eyes and brown hair and regular features. Her age appeared to be about twenty. Her face was pale, as was natural under the circumstances, but it lighted up

with a friendly and grateful smile as the party entered.

She extended her hand to the boys in turn, as Mrs. Sterling introduced them.

"You must excuse my not rising," she said, "but I've had a rather nerve-racking experience, as no one knows better than yourselves. I want to thank you with all my heart for the way you came to my help when I was unable to help myself."

"Oh, you make too much of it, Miss Berwick," Bob replied, and Joe assented with a nod of his head. "We just had the good luck to be close at hand, and if we hadn't done it, somebody else would."

"That doesn't change the fact that you did it," replied the girl. "And you took a chance of losing your lives. The gasoline tank might have exploded and killed us all."

"We're mighty glad that you came out of it as well as you did," said Bob warmly.

"It's almost a miracle that you weren't killed," added Joe.

"I suppose I deserve a severe scolding for having caused all this excitement and damage," was the response. "I don't know what on earth caused the accident. There seemed to be something the matter with the steering gear. Then I got excited and dizzy and tried to stop the ma-

chine. What I think happened was that I put my foot on the accelerator when I meant to put it on the brake. Then when I saw that the car was plunging toward the window, I either fainted or was made unconscious later from the shock. After the first awful crash I didn't know anything more until I woke in this room and found the doctor bending over me."

"You're a stranger to this town, aren't you?" asked Bob, with an idea of getting her mind off the subject, which he could see was beginning to excite her. "Mrs. Sterling was telling us that you had only been here for a few days."

"Yes," responded the girl. "I live in the town of Lisburn, about ten miles from here. I'm all alone in the world"—here a shade of sadness passed over her expressive face. "My father and mother are dead and I live with an aunt of mine. I never had any brothers or sisters. My father died some months ago and left me some property, and it was in connection with that matter that I came to Clintonia. This is the county seat, you know, and I wanted to consult the records in the office of the County Clerk. There seems to be a terrible tangle about the whole thing. Perhaps it was because I became so nervous over the matter that things went wrong yesterday."

"I'm sorry that you've had so much trouble,"

said Bob sympathetically, "and I hope that it will all come out right in a little while."

"If it were just a little confusion or mistake, it probably would," replied Miss Berwick, with a touch of despondency in her manner. "But there's dishonesty involved. I know there is, but I don't see how I'm going to prove it."

"Do you mean that somebody's trying to cheat you out of your property?" asked Bob, with quickened interest.

"It must be the meanest kind of a rascal that would swindle an orphan," put in Joe indignantly.

"I'm afraid there are only too many of that kind in the world," replied the girl, with a faint smile in which there was no trace of mirth. "You see I've never had the least bit of business training and I suppose I would be easy prey. But I'm afraid I'm boring you with my troubles," she added, catching herself up suddenly.

"Not at all," replied Bob, as Joe also made a gesture of dissent. "In fact I hope you'll go right ahead and tell us all about it. Of course we don't know much about law, but our fathers have lived in this town for years and know almost everybody in the county, and they may be able to be of some service to you. Who is the rascal that you think is trying to cheat you out of your property?"

"I don't suppose you know him," replied the

girl, visibly cheered by the sympathy and interest of the boys. "His name is Cassey—Dan Cassey, and he lives in the town of Elwood, only a few miles from Lisburn. He held a mortgage of four thousand dollars on my father's house. When father was taken with his last illness he was very anxious that the mortgage should be paid so that he could leave the house to me free and clear. He had enough money in the bank to pay it and he had me draw it out and keep it in the house. He intended to settle the matter himself, but death came to him before he could attend to it.

"I knew what his wishes were, and as soon as the funeral was over I went to see Cassey and told him that I wanted to pay off the mortgage. I saw his eyes glisten when I told him that I had the money at home to do it with. Of course, I realize now that I ought to have had a lawyer attend to the business for me, but, as I say, I have never had any experience in business and I had a general idea that most men were honest and that there'd be no trouble about it. Cassey made an appointment for me to come to his office the next day with the money. When I went there he was alone. He usually has a stenographer, but I suppose he had sent her away so that there would be no witnesses. I gave him the money in bills."

"Then of course you got a receipt for it," interrupted Bob.

"No, I didn't," replied the young girl, her face flushing. "Oh, don't think that I didn't have sense enough to ask for one," she said, as she saw the boys look at each other in surprise. "I did ask him for one, but he said that the mortgage itself would be a sufficient receipt and he would go over to the bank where he kept it in his safety deposit box and get it for me. Then he looked at his watch, and seemed surprised when he saw that it was past banking hours and too late to get it that day. He said he was awfully sorry, but that he would get it for me the next day and made an appointment for me to call and get it at his office. He seemed so sorry that he wasn't able to give it to me on the spot that I took it for granted that it would be all right and agreed to come the next day and get it.

"I did go about noon the following day, but he wasn't there. His stenographer said that he had been suddenly called away to Chicago by a telegram. I asked her when he would be back, and she said that she didn't know. Then I asked her if he had left any word or any papers for me and she said he hadn't. I told her of my having been there the previous day and of having paid him the money, and she looked at me in

surprise and said she didn't know a thing about it. Then——"

Just at that moment Mrs. Sterling came in, and behind her was the tall form of Dr. Ellis.

"Time's up, boys," the physician said, with a genial smile. "This young patient of mine can't have company very long at a time just at present. It will be all right though to drop in some other time, if Miss Berwick so desires."

"Indeed I do," said the young girl, as the boys, in compliance with the doctor's suggestion, arose to go.

"And we surely will be glad to come," responded Bob for himself and his friend. "We are keen to hear the rest of that story."

They said good-bye and went downstairs and out into the street.

"Why didn't the doctor wait just five minutes more?" grumbled Joe. "He couldn't have picked out a worse minute to butt in. I'm just crazy to know how the thing came out."

"So am I," agreed Bob. "But I've heard enough already to feel sure that that fellow Cassey is a double-dyed crook. He simply saw that he had an inexperienced girl to deal with and he made the most of it."

"I'd like to punch his nose for him," growled Joe savagely, making a swing in the air at an imaginary opponent.

"Same here," agreed Bob, "but that wouldn't get back her four thousand. To think of a man turning a trick like that at the expense of a young girl who had just lost her father! It doesn't seem as though there could be such a mean fellow in the world!"

"Well, however it may seem, there is evidently one who is mean enough."

CHAPTER VI

A PRACTICAL OBJECT LESSON

THE chums were joined outside the hotel by Herb and Jimmy, who had waited for them during their interview. To them they narrated what they had learned of Miss Berwick's story. Their friends shared their own indignation and were quite as keen as themselves to hear the end of the story.

"What did you say the fellow's name was?" asked Herb, as the quartette walked along Main Street.

"Cassey, she said it was—Dan Cassey," replied Bob. "Ever hear of any one by that name?"

"It sounds rather familiar," replied Herb, knitting his brows as he tried to remember. "Wait!" he said suddenly. "I've almost got it—Cassey! Cassey! Does the man stutter, do you know?"

"She didn't say anything about that," replied Joe. "Why do you ask that question?"

"Because," answered Herb, "I remember a

man of that name a few weeks ago calling at dad's store to get a bill of goods. The reason I remember was the way he stuttered when dad was making out the bill. He tried and tried to say something, and his eyes bulged out and his cheeks got all puffed and red while he was trying to get it out. Then he stopped and whistled, and that seemed to help him, for then he went right on talking, only stopping once in a while to whistle again and get a fresh start. I had to get out of the store to keep from bursting out laughing. I remember I felt rather sorry for the fellow at the time, but if he's the fellow who's trying to do Miss Berwick out of her money, nothing's too bad for him."

"Suppose you ask your father what he knows about him," suggested Bob eagerly. "He may know something that may prove of some help to the girl, either in getting her money back or putting the fellow in jail."

"I'll do it," agreed Herb. "By the way, fellows, I dropped into Dave Slocum's place yesterday afternoon and found out that he had a whole stock of material for making wireless telephone sets. Said a salesman from New York talked him into it, and he was wondering how he was going to get rid of them. Thought he'd been stocked up with more than he could sell, all through the salesman's slick tongue. I told

him not to worry, that the boys would be standing in line before long and would clean him out of stock. He seemed to think I was kidding him, but he brightened up just the same."

"Dave's got a pleasant surprise coming to him," grinned Joe. "Just our bunch alone will make quite a hole in his stock."

"You bet," agreed Bob, as, having reached his gate, he said good-bye to his mates and went in. "Don't forget to ask your dad about that Cassey fellow," he called out after Herb.

That Herb did not forget was proved when he overtook his friends the next morning on the way to school.

"I asked dad about Cassey," were his first words, after greetings had been exchanged. "He said he thought very likely the man was the one you had in mind, for this stuttering fellow came from Elwood and his first name was Daniel. It's hardly likely there'd be two men of the same name in that little town."

"Did your father know anything about what kind of fellow he was?" asked Joe.

"Dad said that he had the reputation of being tricky and hard-fisted," answered Herb. "But as far as he knew he hadn't been caught in anything yet that could put him in jail. He went up in the air when I told him about Miss Berwick, and said he'd like to get hold of the fellow

and break his neck. He thinks Miss Berwick ought to get a good lawyer and bring the rascal into court. But at the same time he thinks she may have a hard time proving her case, as she hasn't any receipt or any witnesses. She could simply say she'd paid him and he could say she hadn't. All he'd have to do would be to stand pat and put it up to her to prove her case. And how is she going to do it?"

"Do you mean to say that he could get away with a thing as raw as that?" asked Joe, in a white heat.

"He might," declared Bob. "Things just as rank have been pulled off again and again. But at any rate she ought to get after him right away. She's a dead loser as things stand, and if she can only get the rascal in court she may have a chance. Perhaps he hasn't covered his trail as well as he thinks he has, and when a good lawyer gets to questioning him the truth may come out. In any case it's the only way that will give her a ghost of a chance."

The days passed by swiftly until Saturday came and with it the opportunity the boys had looked forward to of going to Dr. Dale's workshop and getting a few practical points on the making of a wireless telephone set.

They found the doctor at a bench that he had

rigged up in his barn. On the wall was arranged a large variety of tools and on the bench were strewn several coils of wire and a number of objects the name and use of which the boys did not know.

The doctor, who was in his shirt sleeves, extended a hearty welcome to the boys, who ranged themselves about him, and whose numbers were constantly augmented by newcomers until the barn was well filled.

"What I want to do to-day, boys," he said, "is to show you how easy and simple it is to put up a wireless telephone receiving set without having to spend very much money.

"Now the first thing you have to get and put up is the aerial," he remarked, as he unwound a large coil of copper wire. "You want about a hundred or a hundred and twenty feet of that. You can extend it horizontally for about fifty feet, say, for instance, from the side or back of your house to the barn or the garage, and then have it go up as high as it can go. The upper end doesn't have to be in the outer air, for the sound will come along it if it's in the attic. Still it's better to have it outside if possible. The lower end of the wire has to be connected with the ground in some way, and you can fix that by attaching it to a water pipe or any other pipe

that runs into the ground. A good way is to let it down the side of the house and put it through the cellar window and fasten it to a pipe.

"After you have your aerial you want to get the rest of the apparatus together. The first thing to do is to get a baseboard which will serve as the bottom of the receiving box. Something like this," and he put his hand on a board about eighteen inches long, twelve inches wide, and about an inch thick. "This is the platform, as it were, on which the different parts of the apparatus are to rest.

"Now since your ear alone can't detect the waves that are coming to and along your aerial, you have to have a sort of electrical ear that will do this for you. Here it is," and he picked up a piece of crystal and a wire of phosphor bronze. "When this wire comes in contact with this bit of crystal the mysterious waves become audible vibrations.

"But this isn't enough. You've got to get in tune with the sending station in order to understand the sounds you hear. When your vibration frequency is the same as that from which the message is sent, you can hear as clearly as though the voice or instrument were in the next room. Now here's a piece of a curtain pole that's about a foot and a half long. You see that I've wound around its entire length, except for about a half

inch at either end, a coil of wire. This is called the inductance coil. You will notice that the wire is covered with cotton except for this little strip of wire extending lengthwise where I've scraped the cotton off with sandpaper so as to accommodate the sliding contacts. These sliding contacts can be made from curtain rings with holes punched in them, through which are passed copper rivets. These rivets press against the bare path of the coil and can be moved to and fro until you find the exact point where your set is in tune with the sending station."

CHAPTER VII

IN THE DARK

"Now," continued Dr. Dale, as he glanced round the circle of eager faces, alight with interest in the subject, "we're getting pretty close to the time when one picks up the receiver and begins to listen in.

"But as the electric vibrations, if left alone, would have a good deal of trouble in passing through the telephone receiver, we must have a condenser to help them out. This is very easily made by gluing a piece of tinfoil about one and a half inches square to each side of a sheet of mica. Then you must have two strips of tinfoil, one extending from each side of the mica. If you haven't any mica, a sheet of ordinary writing paper will do, though the mica is better.

"The telephone receiver you will have to buy, as a satisfactory one can't very well be made by an amateur. The receiver ought to have a high resistance to get the best results.

"There," he said, as he laid the telephone re-

ceiver on the bench, "those are the essential things you have to have in order to make a set of your own. With these things only, it will of course be a simple set and have a limited range. There are a hundred improvements of one kind or another that you'll learn about as you get more expert, and these can be added from time to time. But the special thing I wanted to prove to you to-day was that it would take only a very small expenditure of money to get this material together. You see how many things I've used that any one of you can find about the house, such as tinfoil, curtain poles, curtain rings, wood for the box, and so on. The wire needed for your tuning coil and your aerial can be obtained for less than a dollar. The detector, including the crystal, can be got for another dollar. An excellent receiver can be bought for two dollars. A few minor things will be needed at perhaps five or ten cents each. Altogether the cost of the set can be brought within five dollars."

This was good news to the boys, many of whom began at once a mental calculation as to the amount of their pocket money, while others began to figure on odd jobs that might bring them in the required amount, in the event that their parents would not supply the money.

With a few deft movements the doctor attached the various parts of the apparatus to their

proper places on the baseboard. There was not time that day to put up the aerial, but he gave them practical illustrations of how to use the detector by pressing the point of the wire firmly against the crystal, how to slide the rings back and forth until they found the point of greatest loudness and clearness, and all other points essential to using the set successfully. Not all the boys caught on to all that was involved, but to the majority it was made reasonably clear. To Bob and Joe, who had followed every point of the demonstration with the keenest attention, the operation of the receiving set was made as clear as crystal, and they had no doubt of their ability to construct a set for themselves. Herb's attention had wandered somewhat, because in the back of his mind there still lurked the idea of buying a set ready made. Jimmy had been somewhat distracted by looking about in various parts of the barn to see if he could detect the presence of any "eats," and his ideas were somewhat hazy in consequence.

"Well, boys," at last said the doctor, with a smile, "I guess we'll call it a day. But remember that if at any time you are puzzled and want more information all you have to do is to come and ask me. I'll gladly lay aside my work any time to help you youngsters out."

The boys thoroughly appreciated the doctor's

cordiality and the demonstration that he had given them, and most of them took occasion to tell him so as they said good-bye to him and filed out of the extemporized workshop.

"He certainly does make things clear," said Bob enthusiastically, as he and his friends made their way toward their homes.

"Not only that, but he makes you want to do them," said Joe. "After seeing and hearing him this afternoon, I'd ten times rather make a set than buy one."

Jimmy agreed with them, and even Herb seemed ready to reconsider the idea of getting one ready made, though he was not yet quite prepared to surrender.

"All of you come over to my house to-night," said Bob, as they neared their homes. "We haven't got the materials yet, but we can go over again what the doctor told us to-day and make sure that we've got it all straight in our minds. What one forgets, the other may remember. Then when we do get the stuff we can put a little snap and speed into making the set."

"That will be bully," replied Joe, and the others agreed with him. "For my part," Joe continued, "I count every day lost that we have to go without it. I sure am becoming a radio fan."

It turned out that Herb was prevented from

coming by unexpected company but the others were there. Their talk that night was animated and enthusiastic, so much so in fact that the time passed more quickly than they imagined, and they were surprised when the clock struck eleven.

"By the way," said Jimmy, as he was preparing to leave with the rest, "I had a run in with Buck Looker when I was coming here to-night, and he said he was going to lay for me and do me up."

"He did, did he?" asked Bob. "What was he sore about?"

"Oh, he's had a grouch ever since the day of the fire," replied Jimmy. "You remember that when he spoke of the work he'd been doing to help put out the fire, I spoke up and said that he hadn't done a thing. He's had it in for me ever since. He bumped against me on purpose to-night just as I was coming in the gate, and when I called him down for it he said he was going to lay for me and change my face."

"The big bully!" exclaimed Bob. "Just wait here a minute while I go into the next room."

The adjoining room was dark and commanded a view of the street in front, while Bob himself could look out of the window without being seen. Some large shade trees were on the other side of the street, and as Bob's eyes became accustomed to the darkness, he could dimly descry three

forms lurking in the shadows. One of them he felt sure was Buck, and he felt reasonably certain that the others were Carl Lutz and Terrence Mooney, Buck's boon companions.

"I guess Buck and his gang are hanging around all right," he announced, as he returned to the other room and reported his discovery. "But he's going to get a little surprise party. I tell you what we'll do. You go out of the front door alone, Jimmy. Joe and I will stand there in the light from the hall lamp and say good-night. Then we'll close the door, and you stand on the stoop a minute, buttoning your coat, and then go slowly down the walk. That will give Joe and me a chance to slip around through the back in the darkness and get behind the bushes near the gate. Leave the rest to us."

"And what we'll do will be a plenty," added Joe.

Jimmy thought well of this plan, and agreed to do his part.

They followed out this program to the letter. As Jimmy came down the walk, the lurking figures across the street came out from the shadow of the trees and over toward him.

"I've got you now, Jimmy Plummer," snarled the voice of Buck Looker. "I told you I was going to take some of the freshness out of you, and now I'm going to tan your hide."

"Does it take three of you to do it?" asked Jimmy.

"None of your lip now," growled Buck, as he clenched his fist. "I'm going to have the fun of doing it myself."

With one spring Bob vaulted over the low fence.

"You've got another guess coming, Buck Looker," he said coolly.

The bully started back in surprise and consternation, which was not diminished when Joe followed his friend's example and stood at his side.

"What are you butting in for?" Buck snapped, as soon as he recovered his breath.

"Because I choose to," answered Bob. "Because I won't stand by and see you hit a fellow half your size. If it's fighting you're looking for, I'll give you all the fighting you want right here and now. If your gang want to mix in, Joe will take care of Lutz and Jimmy can look after Mooney. But I'll take you on myself. How about it? Is it a go?"

He advanced on Buck, and before his flashing eyes those of the bully wavered and fell.

"I—I'll settle with you some other time," he stammered, retreating toward the middle of the street.

"No time like the present," challenged Bob,

but as Buck, muttering threats, still continued to retreat, while his cronies slunk away with him, Bob gave a little laugh and came back to his friends.

"All right, Jimmy," he chuckled. "I guess your face won't be changed to-night. Buck seems to have changed his mind."

CHAPTER VIII

GETTING A START

THE idea of having their own radio outfit and being able to hear all the wonderful things going on in the air about them so fascinated the boys that they could talk or think of little else. Even Jimmy Plummer became so excited that his mother declared he was actually forgetting to eat, a statement that his father flatly refused to believe at first, until he escorted his rotund son to the nearest scale and discovered the astonishing fact that he had really lost two pounds.

"You see how it is, Dad," said Jimmy, mournfully. "If you don't give me the money to get some wireless stuff I'll just pine away and die."

"It wouldn't hurt you to pine away about twenty pounds, anyway," said his father, with a twinkle in his eye. "But I suppose if you've set your heart on it I might as well come across now as later and save myself from being pestered to death. How much do you suppose you'll need to get started?"

"The other fellows are figuring that about five dollars apiece will buy most of the things we'll need—at first, anyway," he added, with a careful eye to the future.

"All right, here it is," said Mr. Plummer. "And I suppose the next thing we know you'll be breaking your neck falling off the roof while you're trying to put up aerials, or whatever it is they call the contraptions."

"Leave that to me," said Jimmy. "And I'll bet you'll get lots of fun out of this too, Dad, when we get it going."

"Well, maybe so," said his father. "But I don't take much stock in the whole business. Some wonderful things happen these days, though, and you may be able to change my mind."

"I'm sure I will," said Jimmy, with conviction. "And if you had heard what I did at Doctor Dale's house, I'll bet you'd want a radio outfit as much as I do."

"Well, go ahead and see what you can do, Son. If you can really get the thing working, so much the better."

The next day Jimmy lost no time in hunting up his friends and telling them of his good fortune. He found that the others had not been far behind him in procuring the necessary cash. That afternoon they all descended on the hardware store, whose proprietor had laid in a stock

of the materials that would be likely to be needed in the construction of simple radio outfits. The hardware merchant was glad to see them, but somewhat surprised also.

"Gosh!" he exclaimed, when he learned what the boys had come for. "When that salesman from New York talked me into stocking up with all that stuff, I never thought I'd get a sale for it in the next ten years. And now here's all you youngsters coming in here after it with money in your fists."

"Yes, and you'd better lay in a whole lot more of it, Dave," said Bob Layton. "It won't be long before everybody in this town will be wanting a wireless radio outfit."

"Well, I guess I've got enough in the store now to start you fellows on your way," said Dave Slocum, the proprietor. "Now, what all do you need?"

There followed a time of much consultation and anxious questioning before all the enthusiastic young experimenters were satisfied that they were getting the most useful things their limited amount of capital would buy. Dave Slocum sold more feet of copper wire in that one afternoon than he had in the previous five years, not to mention insulators, resistance wire, detectors, head sets, and all the other paraphernalia necessary to the beginner. At last all the various pur-

chases were tied into neat bundles, and the excited boys swarmed out into the street.

"Let's go to my house and get started right away," proposed Bob. "It will be quite a job to get the aerial strung, and the sooner we do it the better it will suit me."

The others were of the same mind, and they made the distance to the Layton home "on the jump" with Jimmy puffing valiantly in the rear in a desperate endeavor to keep up with his more active comrades.

"Gee!" he exclaimed, staggering up the steps to the cool veranda, "you fellows must think I'm a candidate for Marathon runner at the next Olympic games, the way you hit it up coming here."

"I don't know about the Marathon race," said Joe, "but I do think we could enter you in the long distance pie-eating contest, without having any doubts of your winning away out in front of the field."

"Well, I don't want to boast, but I think I could do myself proud," admitted Jimmy. "I don't think I ever really got enough pie to satisfy me yet."

"Never mind about pies now," said Herb. "The question before the house is to get an aerial strung from Bob's house to the barn. What's the best way to get up on the roof, Bob?"

"There's a trap door in the roof not far from the chimney," replied Bob. "I was thinking that we could make a mast and lash it to the chimney. That would give us one secure anchorage for the aerial, and the other we can fasten to the roof of the barn easily enough."

"What are we going to make the mast out of?" inquired Joe.

"There's a nice piece of four by four lumber out in the barn," replied Bob. "I was thinking that we could leave it square at the bottom and plane it off round at the top, so as to look better. I don't see why that won't fill the bill all right."

"Sounds all right," said Herb, and, with Bob leading, all four boys piled out to the big barn back of the house. Bob produced his scantling and hunted up a big plane. Then the boys set to with a will, and in a short time had the rough timber nicely smoothed off, with a slight taper toward the top. Then they screwed in a large hook, bought for the purpose, and after providing themselves with a generous length of rope, repaired to the roof of the house.

As Bob had told them, there was a large scuttle leading from the attic onto the roof, and one after another they clambered out through this. The roof sloped gently at this point, and while they found it necessary to be careful, they had

little difficulty in reaching the chimney. Before erecting the mast they fastened one end of the aerial over the hook in it. The aerial consisted of a single, number fourteen, hard drawn copper wire, insulated at each end by an earthenware insulator having two hooks embedded in it. One of these hooks went over the hook in the mast, while the other had the end of the wire attached to it. A similar insulator was provided at the other end of the wire, thus preventing its becoming grounded to the house or barn.

Having hooked up one end of their aerial, the boys erected the mast against the chimney, and lashed it firmly in position with the rope they had brought up.

"There!" exclaimed Bob, when everything was fixed to his liking, "that mast looks as though it might stay put a while. Now let's rig up one on the barn, and we'll have the first part of our job done, anyway."

Clambering back to the scuttle, the boys dropped through to the attic floor and hurried downstairs. It was beginning to get dark, and as they wanted to get the aerial up while daylight lasted, everything went with a rush. Poor Jimmy thought more than once of his father's prophecy that he would lose weight in such strenuous activities, but he was as anxious to receive

the first radio signals as any of the others, so he followed the headlong pace the others set without a murmur.

Of course there was no convenient chimney on the barn to act as a support for the mast, but they finally rigged up a mast at one end of the barn, nailing it securely to the siding boards. Then they drew the copper wire through the hook in the insulator until there was just a little slack, cut off the wire, and wound it securely. Then they all gazed with pride at their handiwork, and had the comfortable feeling that comes of work well done.

"Hooray!" shouted Jimmy. "That's what I call a good job, and it didn't take us such a long time, either."

"Yes, but that's only the beginning," said Joe. "I only wish we had more time to-night. I feel as though I'd like to keep right on now and not stop until we're actually receiving."

"You'd be pretty hungry if you tried to do it," remarked Jimmy. "To hear you talk, you'd think making a receiving set was about as hard as taking a run around the block."

"It isn't much harder than for you to take a run around the block," laughed Herb. "You were puffing like a steam engine while we were coming up from the store this afternoon. If you don't cut down on the eats, Doughnuts, you'll

have to get around in a wheel chair. You won't even be able to walk, let alone run."

"There you go," complained Jimmy, in an aggrieved tone. "Just because I'm not as skinny as you fellows, you think that I eat more than you do. Nobody could eat more than you do, Herb, and live to tell the story."

"I don't have to tell any stories along that line," retorted Herb, with a laugh. "My friends do that for me."

"I'll bet they do," grumbled Jimmy. "I get some result out of what I eat, anyway, and that's more than you can say."

"Oh, I can say it, all right, but probably nobody would believe me," admitted Herb.

"Right you are, Herb, old boy!"

"When you two fellows are all through arguing, maybe we can go up and hook on our leading-in wire to the aerial," said Joe, impatiently. "We ought to get that much done before dark, anyway."

"I don't know about that, Joe," objected Bob. "It's almost dark now, and we could do it better and easier in the daylight. What do you say if you all come around after supper and we'll dope out a wiring diagram and maybe make a start on building the tuning coil."

Joe reluctantly consented to this, and the four companions separated for the time being, after

promising to return to Bob's house that evening. And true to their promise, the boys had all returned to the Layton home by eight o'clock that evening, full of enthusiasm for the task that lay before them. Mr. Layton was mildly interested in the radiophone project, but after a few questions he retired to the library with the evening paper, leaving the boys to their own devices.

CHAPTER IX

WORK AND FUN

"WELL, fellows," said Bob, "here we are, all set for a busy evening. What shall we do first?"

"What I'd suggest," said Jimmy, "would be for everybody to have a little milk chocolate, just to start things off right," and he produced a huge bar of that toothsome confection and passed it around, with an earnest invitation to everybody to "help himself."

"It isn't such a bad idea, at that," admitted Bob, breaking off a chunk that made Jimmy gasp. The others imitated his example, and by the time the bar of chocolate got back to Jimmy it had shrunken so greatly that the last named individual gazed at it mournfully.

"Gee whillikins!" he exclaimed, "you fellows certainly do like chocolate, though, don't you?"

"I do, anyway," said Herb, laughing at the rueful expression on his friend's face. "Have you got any more when that's gone, Doughnuts?"

"No, I haven't. But if I had you can bet I'd

hold on to it," said Jimmy. "How do you expect me to work if I don't have anything to keep my strength up?"

"Who said we expected you to work?" demanded Joe. "I'm sure we wouldn't be so foolish, would we, fellows?"

"Oh, I don't know," retorted Jimmy. "You're foolish enough for anything else, so why not that?"

"Well, if you say so, I suppose that settles it," said Joe. "But, anyway, as long as Jimmy was so careless as not to bring more candy along, I suppose we'd better get to work."

"Shall we get the tuning coil started?" suggested Bob. "It will take us quite some time to do that, but we might get the core wound tonight, anyway."

As there was no objection to this, they all went down to the cellar, where Bob had rigged up a work bench and had a pretty complete stock of tools. Jimmy's father had made them a wooden form on which to wind the wire. This core was nothing but a plain cylinder of wood, about three inches in diameter and ten inches long. For Christmas, the year before, Mr. Layton had given Bob a small but accurately made bench lathe, operated by a foot pedal, and Bob mounted the roller between the lathe centers, holding one end in the chuck jaws. Then he produced a narrow

roll of stout wrapping paper, such as is used for winding around automobile tires, and a bottle of shellac, together with a small, fine-haired brush.

"First thing," he said, "we want to wind a few layers of shellacked paper on this core. Suppose I turn the core, you let the paper unwind onto it, Joe, and you can shellac the paper as it unrolls, Herb."

"That leaves me with nothing to do but boss the job," said Jimmy, "and I don't see why I can't do that as well lying down as standing up, so here goes," and he stretched out luxuriously on an old sofa. "This must have been put here just for me, I guess," he continued, with a sigh of perfect contentment. "Get busy, you laborers, and flash a little speed."

"We haven't got time to come and throw you off that sofa just now," said Bob. "But as soon as we get through with this job you'll vacate pretty quick. Are you fellows ready to start now?"

"I've been ready for the last half hour," said Joe. "Start that jigger of yours going, and let's see what happens."

Bob put a dab of shellac on one end of the paper to get it started, stuck the end on the wooden core, and then started winding the paper onto it at a slow speed. Joe moved the roll of paper back and forth to wind it smoothly and

evenly, while Herb shellacked for all he was worth, giving himself almost as liberal a dose of the sticky gum as he gave the paper. It was not long before the core was neatly wrapped, and Bob stopped his lathe.

"That looks fine," he said, eyeing the job critically. "Now, while that shellac is drying out a bit, let's see if we can't coax Doughnuts to get up off that couch."

All three boys made a dive for their luckless companion, but he was up and off before they could reach him, with a nimbleness that would not have disgraced a jack rabbit.

"No, you don't!" he exclaimed. "I beat you to it. I suppose it makes you feel jealous to see me resting once in a while, instead of slaving my head off as usual. If you Indians had your way I'd be worn to a shadow in no time."

"It's easy to see we don't have our way much, then," laughed Herb. "You've got a long way to go before you get in the shadow class, Jim."

"It can't be too far to suit me," responded that youth. "But what I want to know is, is that tuning coil wound yet? Seems to me you take a lot of time to do a simple thing like that."

"You'd better sing small, or first thing you know you'll find yourself in the coal bin," threatened Joe. "How about throwing him in just for luck, fellows?"

"You've got a funny idea of what luck is," said Jimmy. "I never did care much for coal bins. Thank you just the same."

"You're welcome," retorted Joe. Then to Bob: "Do you think we can wind the wire on now, Bob?"

"Why, I guess so," said Bob, testing the shellac with his finger. "It's getting pretty tacky now; so if we wind the wire on right away the shellac will help to hold it in place when it dries."

"Well, start up the old coffee mill, then," said Herb. "If we can get the wire on as slick as we did the paper, it won't be half bad."

But the wire was a more difficult thing to work, as they soon found. It required the greatest care to get the wire to lie smooth and close without any space between coils. More than once they had to unwind several coils and rewind them before they finally got the whole core wound in a satisfactory manner. But at last it was finished, all coils wound smooth and close, and the boys gazed at it with pardonable pride.

"That doesn't look as bad as it might, does it?" said Bob.

"I should say not!" exclaimed Joe. "The last time I was in New York I saw a coil like that in an electrical store window. I didn't know then what it was for, but as far as I can remember, it didn't look much better than this one."

"We probably couldn't have made as good a job of it if Bob hadn't had that lathe," said Herb.

"Well, I don't know," said Bob. "It would have taken us longer, but I think we could have done it about as well in the end. Now that we've got the core wound, we'll have to mount it with a couple of sliding contacts, but I guess we'd better not try to do anything more to-night. It's getting pretty late. And, besides, mother said she'd leave an apple pie and some milk in the ice box, and I'm beginning to feel as though that would taste pretty good."

CHAPTER X

A STEALTHY RASCAL

"Did you really say pie, Bob?" asked Jimmy in a rapturous voice. "And apple pie at that? Or was it all only a beautiful dream?"

"There's only one way to find out, and that's to go and see," said Bob. "Last man up gets the smallest piece," and he made a dash for the stairs, closely followed by the others. Poor Jimmy, in spite of a surprising burst of speed on his part, was the last one up, and arrived out of breath, but ready to argue against Bob's dictum.

"Don't you know that if there's a small piece it's up to the host to take it?" he asked Bob, who by that time had secured the pie and was cutting it. "If you were really polite you wouldn't eat any of that pie at all. You'd give all your time to seeing that we had plenty."

"Yes, but I'm not that polite," said Bob. "I think I deserve credit for not waiting till you had all gone home and then eating the whole thing

myself. That's probably what you'd do, Doughnuts, if you were in my place."

"I wouldn't either," disclaimed Jimmy indignantly.

"Of course he wouldn't eat it after we'd gone," grinned Herb. "And if you coax me real hard, I'll tell you why."

"All right, I'll bite," said Joe. "Why wouldn't Doughnuts eat the pie after we'd gone home?"

"Because he would have eaten it all before we even got here," replied Herb, with a shout of laughter. "Ask me a harder one next time."

"I suppose you think that's real smart, don't you?" remarked Jimmy sarcastically. "But I don't care what you say, as long as there is pie like this in the world," and he bit off a huge mouthful with an expression of perfect ecstasy on his round countenance.

"It is pretty easy to take," admitted Herb, as he proceeded to dispose of his share in a workmanlike manner. "This is regular angel's food, Bob."

"Yes, it was made especially for me," said Bob, trying to look like an angel, but falling considerably short of the mark. It is hard for any one to look very angelic with a big piece of apple pie in one hand and a glass of milk in the other.

"Suppose you cut out the angel business and

hand me over another piece of that pie," suggested Jimmy. "If you're an angel, Bob, I hope to die a horrible death from slow starvation, and I can't say any more than that, can I?"

"You'd better speak nicely to me, or you won't get another piece," threatened Bob, holding a wedge of pie temptingly in Jimmy's direction. "Am I an angel, Doughnuts, or not? Yes—pie. No—no pie."

"Of course you are, Bob, and you know I always loved you." Bob passed him the pie, and Jimmy clutched it securely.

"Thanks, you big hobo," he grinned.

"There's gratitude for you," said Bob, appealing to the others. "He knows the pie is all gone now, so he thinks he can insult me and get away with it."

"So I can," said Jimmy complacently. "You know you could never get along without my advice and help, Bob. You need somebody around you with brains, to make up for Joe and Herb."

"That pie must have gone to your head," said Joe. "We'd better try to get him home where they can take care of him, Herb. He'll probably be telling us he's Napoleon, if we let him get a little crazier."

"I'm going right away, anyway," said Jimmy, hunting back of the door for his cap. "I worked so hard making that tuning coil that I'm all in.

I'll need a good night's sleep to set me on my feet again. So long, fellows," and he went away whistling.

The others followed soon after, after agreeing to meet the next afternoon to mount the tuning coil.

As Bob and Joe were on their way home from school the following day they caught sight of Miss Berwick sitting on the porch of the hotel, enjoying the bright spring sunshine. She nodded to them brightly and invited them to come up on the porch. They were quick to accept the invitation, and as they dropped into seats beside her they were glad to note that there was more color in her cheeks than when they had seen her last.

"No need of asking whether you are feeling better," remarked Bob. "One can tell that by just looking at you."

"Oh yes," replied Miss Berwick with a smile. "I'll soon be as well as ever, thanks to the good doctoring and nursing I've had."

"It was too bad that the doctor came in just when he did the other day," said Joe. "We were keen to hear the rest of your story about that fellow Cassey. Has anything turned up to tell you where he is and what he is doing?"

"Not a thing," replied the girl, with a tinge of sadness in her tone. "From the moment I paid

him that money, I've never laid eyes on him. For some days after he was said to have left for Chicago, I haunted his office, hoping that with every mail there might be a letter either to me or his stenographer explaining the matter and setting it right. I tried to get his Chicago address, but his stenographer said she didn't know it, and I think it likely enough she was telling the truth. I've looked through the records here to see if he had transferred the mortgage, but it still stands in his name, as far as the records go. I have clung to the hope that possibly he had written to me and that the letter had gone astray. But I guess I'm just fooling myself. I'm going to put the whole thing in the hands of a lawyer and have Cassey brought to justice if I can. But I'm afraid it'll be a case of locking the stable door after the horse is stolen."

"Don't get downhearted," urged Bob. "I have an idea that you'll get your money or the mortgage. Slicker rascals than he have been caught, no matter how carefully they covered their tracks. There's usually one little thing they've forgotten that leads to their getting nabbed at last."

"Let's hope so," replied Miss Berwick, but none too confidently. "But now tell me something about yourselves. It isn't fair that my troubles should take up all the conversation."

The boys told her of their radio experiments, and she listened with the keenest interest.

"That reminds me," she said. "I noticed a radio telephone set in this man Cassey's office. His stenographer told me that that was his one recreation."

"You find them everywhere," replied Bob. "They'll soon be a feature in almost every home and business office. But we'll have to go now," he said, as he rose to his feet, while Joe followed his example. "Good afternoon. And don't forget what I said. I feel you'll get your money or you'll get your mortgage."

CHAPTER XI

CLEVER THINKING

THE radio boys were at Bob's house on the dot, all but Jimmy, who to his great disgust had to do some work for his father, and so could not come.

"I suppose we'll have to try to get along someway without his valuable assistance," said Herb. "When he told me he couldn't get here this afternoon he certainly felt sore about it."

"I guess I know how he feels, all right," said Joe. "It would pretty near break his heart not to be able to work on this radio stuff now. I'm crazy for the time to come when we can pick our first message or music out of the air."

"I guess you're no more anxious for that to happen than we are," said Bob. "Let's go downstairs and see what we can do."

They all made their way to Bob's workroom in the basement, where they found the core well dried and the wire as firmly set on it as the most particular workman could desire.

"Good enough!" exclaimed Bob, examining the

core with loving pride. "We'll get this set up in a jiffy, and then we can make the condenser."

Working together, the boys soon had two square blocks sawn out as end pieces, and they centered the core on these and screwed it fast. Then they drilled holes in the two upper corners of the square end pieces to fit two brass rods they had bought at the hardware store. These rods carried each a small sliding spring, or contact, which rubbed along the length of the tuning coil, one on each side. After they had bolted the brass rods securely in place, the coil was ready for use, except that the boys had first to scrape off the insulating enamel in the path of the sliding contacts, so that they could reach the copper coils. A sharp pen knife soon effected this, and the boys found themselves possessed of a neat, substantial tuning coil, at a cost of only a fraction of what it would have been if they had had to buy a coil already made. And in addition they had the satisfaction that comes of a good job well done, which more than compensated them for the labor involved.

"That begins to look like business," exulted Joe. "We'll be putting Mr. Edison out of business pretty soon."

"Yes, it's lucky he can't see that tuning coil," laughed Bob, "he'd be looking up the want ads in the papers, sure."

"Oh, that coil won't be a patch on the condenser we're going to make," declared Herb.

"I know we've got to have a condenser, but I'm blessed if I really understand what it is for," said Joe. "I know the doctor told us about it, but I guess I didn't get a very clear idea of what it was all about."

"I'm not very clear on it either," admitted Bob. "But from what he said and what I've read, it seems to be a sort of equalizer for the electric current, storing it up when it's strong and giving it out when it's weak. It prevents the current getting too strong at times and burning something out."

"That's the way I understood it, too," said Herb. "And Dr. Dale said that in the larger sets they have what they call a variable condenser, so that they can get more or less damping action according to the strength of the incoming current waves."

"I guess I get the idea," said Joe. "But it's a pretty complicated thing when you first tackle it, isn't it?"

"Yes, but it's just like almost anything else, probably—it's easy when you know how," said Bob.

"It tells here how to make the condenser," said Herb, who had been looking over an instruction book that the boys had bought. "But it says the

best thing to use for the plates is tinfoil. Now, where are we going to get the tinfoil from, I'd like to know!"

"If you want to know real badly, I'll tell you," said Bob. "Right out of that box over in the corner. Just wait a minute and I'll show you."

Bob stepped swiftly over to the box in question and produced a big ball of tinfoil, composed of separate sheets tightly packed together.

"When I was a kid I used to collect this stuff and sell it to the junkman," he said. "This ball never got big enough for that, and I forgot all about it until a few days ago when I happened to come across it and thought that it would be just the thing for us to use now. We can easily peel off all the sheets we need, I guess. Some of them are damaged, but there are enough whole ones to do our trick."

"Gee, that's fine!" said Joe. "Pry off some, Bob, and let's see if it will serve."

With his knife Bob pried away at likely looking places, and soon had several large sheets off. These, when smoothed out, looked good enough for any purpose.

"How many does the book say we'll need, Herb?" asked Bob.

"It says eight or ten, each one about four inches square," answered Herb. "And it says they have to be separated by paraffined paper.

How are we going to get hold of some of that?"

"Paraffine wax is what they use to seal fruit jars," said Joe. "We ought to be able to get some of that easy enough."

"Mother had a big cake of it last summer!" cried Bob. "Maybe she has some of it left. Wait here and I'll ask her," and he dashed up the stairs three steps at a time.

In a few minutes he returned, having obtained not only the wax but a small sauce pan in which to melt it.

"I thought I'd bring this along, so as to have it," he said; "but it's so near supper time that I don't think we'll have a chance to do much more —right now, anyway. What do you say if we knock off now and do some more work this evening after supper?"

"Gee, I never thought it was that late," said Herb. "If Jimmy had been here, I suppose he would have been talking about supper for the last hour or so, and we'd have known what time it was."

"Well, I'll be here for one," said Joe, "and I'll stop at Jimmy's house on the way home and tell him to get around, too."

"I'll come too," said Herb. "And, Joe, while you're about it, tell Jimmy to be sure and bring another chunk of chocolate, only bigger than the one he had last night."

"I'll be sure to mention that," grinned Joe. "But I don't think he'll do it, just the same."

Bob went upstairs with them, and Herb and Joe went away together, after promising to come back as soon after supper as possible. After they had gone, Bob could not resist the temptation to go down and gaze with an approving eye on the shiny new tuner they had made, and dream of the many wonderful sounds that would soon come drifting in through that gleaming bit of mechanism.

CHAPTER XII

FORGING AHEAD

THE Laytons had hardly finished supper that evening before Jimmy's cheery whistle was heard outside, and Bob jumped up to let him in.

"Come in, old timer," Bob called to him. "Where's the rest of the bunch?"

"Oh, I guess they'll be along pretty soon," said Jimmy. "I guess I'm a bit early, but I was so anxious to get around that I couldn't wait to come at a respectable time. I suppose I should be boning down for to-morrow's lessons, but I'd never be able to get my mind on them until we get our outfit going."

"I feel the same way," said Bob. "But at the rate we're going now it won't be very long."

"Joe told me you finished the tuning coil this afternoon," said Jimmy. "I don't understand how you ever did it without my being here to tell you how, though."

"Oh, we managed to patch it up some way," laughed Bob. "Come on down and look at it, and see if it's good enough to suit you."

"Lead me to it," said Jimmy, and the two boys went downstairs.

"Say, that's a pippin," said Jimmy, as Bob switched on the light and he caught sight of the finished tuner. "I couldn't have done it better myself. You've certainly made a first class job of it."

"We thought it wasn't so bad," admitted Bob modestly. "Especially when one stops to think that you weren't here to give us the benefit of your advice."

"That's the most surprising thing about it," said Jimmy. "But now that I'm here to-night, why, we can go right ahead and get a lot done. Seems to me it must be about time for Joe and Herb to show up."

As though in answer to this thought, they heard a tuneful duet, and a moment later came a vigorous ring on the doorbell.

"You go up and let them in, will you, Doughnuts?" said Bob. "I want to melt this paraffine and get things started right away."

"Sure I will!" And Jimmy hastened off, returning a few minutes later with the missing members of the quartette.

"It's about time you got here," said Jimmy. "Bob and I were wondering if we'd have to do all the work by our lonesome, as usual."

"Gee, you don't know what work means," re-

turned Joe scornfully. "Last evening you pretty near wore a hole in that old couch resting on it, and this afternoon you were enjoying yourself helping your father instead of coming here and doing a little honest work for a change."

"Oh, yes, I enjoyed myself a lot!" exclaimed Jimmy. "I sawed enough one inch planks this afternoon to make either one of you loafers cry for help! And then you talk about my having enjoyed myself!"

"Well, if you worked so hard, maybe your dad gave you enough money for it to buy a respectable piece of chocolate with instead of that measly little sample you brought around last night," said Herb.

"You're right he did, and here it is," said Jimmy. And from under his coat he produced an immense slab of delicious looking chocolate that must have weighed all of a pound.

The shout that went up from his three friends might well have startled the family upstairs.

"Jimmy, we've got to hand it to you; you're a good sport," cried Bob, laughing. "I never really thought you'd ever bring any more, after the way we ate what you had last night."

"I'm glad that you admit that you ate more than your share," said Jimmy, severely. "But I thought I'd bring enough around to-night, hoping there might be a little piece left over for me."

"I think that since he's so generous we ought to let him have a real big piece," said Joe.

"Yes," grinned Herb. "But remember that chocolate candy is about the worst thing a fat person can eat. It might be better for Doughnuts, after all, if we took this away from him right away. I'd rather get sick myself eating it than see him get any fatter."

"Say, how do you get that way?" demanded Jimmy in an aggrieved tone. "I've never been able yet to get hold of enough candy to make me too fat, and if I should, I'm the one that ought to worry about it."

"It looks to me as though there's enough there for all of us for a week," said Bob. "Let's break it up and put it in this box over here, and then anybody who wants any can help himself."

"That's fair enough," said Jimmy. "But I'll bet anything it won't last this bunch any week. If you were all like me it might, but I suppose that's too much to ask."

"I don't think that's asking very much, do you, fellows?" said Joe, with an exasperating grin.

"Wow!" exclaimed Herb, laughing. "That has all the appearance of a dirty dig, Joe. If I were you I wouldn't let him have a scrap of that chocolate, Jimmy."

"I suppose I shouldn't. I ought to let him chew on a piece of that paraffine that Bob's melt-

ing. He's so foolish sometimes that I don't think he'd ever know the difference."

"Well, we can't all of us be wise," said Joe. "But I've got a hunch that I'd rather have the chocolate, so here goes," and he helped himself to a generous piece. "When are you going to have that wax cooked good and tender, Bob?"

"Suppose you leave the wax to me, and you get busy cutting out some squares of tinfoil and paper," suggested Bob. "This wax will be done a long time before you're ready for it."

"All right, I'll do it," said Joe. "I don't suppose there's anybody in the world can beat me at cutting out squares of paper. There may be some things I can't do, but I sure shine at that."

"Yes, I guess you can do that all right," admitted Bob. "But I can't be real sure until you give us a demonstration."

"Here goes, then," replied Joe. "How big do they want to be?"

"Four inches square, the book says, and I suppose the man that wrote it knew what he was talking about," said Bob. "That will do to start on, anyway."

Joe carefully measured a square of paper to the required dimensions, and then used it as a pattern in cutting out the others. He soon had a number of neat squares ready, which he handed to Bob, who immersed them in the melted wax.

While the paper was soaking this up, Joe cut out a corresponding number of tinfoil squares, leaving a projecting tongue on each one to serve as a terminal.

"You're an expert at carpenter work, Doughnuts," said Bob. "If you feel as ambitious as usual you can cut a couple of squares out of that oak plank over in the corner. We'll need them for end pieces to this condenser."

"Oh, that will be lots of fun," said Jimmy, who had been casting longing glances toward the old sofa. "I'd a good deal rather saw some more wood than take it easy. How big shall I make them?"

"About five inches each way, I should say," answered Bob, reflectively. "That will give us room to drill holes in each corner to put the clamping bolts through. In that drawer under the table you'll find some drills. I think a three-sixteenth drill ought to be all right. There are four brass bolts in that bag on the table, and you can measure them and see what size drill you'll need. I bought them for three-sixteenth, anyway."

"You go ahead and cut out the pieces, Jimmy," said Herb. "I'll do the real hard work, like measuring the bolts and picking out the drill. Then when you get the end pieces cut out, the

drill will be all ready for you to put the holes through."

Jimmy gave him a withering glance, but rolled up his sleeves and set to work. Once started he made the sawdust fly, and before very long had two stout looking pieces of solid oak cut out.

"Where's your drill, Herb?" he inquired then. "Don't tell me you haven't got that ready yet!"

"All ready and waiting," was the reply, and Herb handed over the required tool. "Go to it, and see that you make a first class job of it."

Clamping both pieces of wood in the vise, Jimmy ran the sharp hand drill through in a workmanlike manner, and then viewed his work with pardonable pride.

"There you are," he said. "If this condenser doesn't condense, it won't be because it hasn't got two good end pieces, anyway."

"It's funny that you should have to condense electricity," said Herb, with a twinkle in his eye. "It's just the same as milk, isn't it?"

"Yes, it isn't," said Bob. "Another wise remark like that, and you'll find yourself out in the wide, wide world, young fellow."

"I should say so," said Joe. "That was a fierce one, Herb."

"Well, I'll promise to be good," returned Herb. "But I still think that was a pretty fine joke, only

you fellows haven't got enough sense of humor to appreciate it."

"We've got sense enough not to appreciate it, anyway," said Jimmy. "It's weakened me so that I'll have to have another piece of chocolate to brace me up," and he suited the action to the word.

"When you've all had all the candy you want, we can go ahead and make this condenser," said Bob. "Don't let me hurry you, though."

"No chance of your hurrying me," replied Jimmy. "I'm so all in now I can hardly move. But Herb and Joe will do anything you want them to. They've been taking it easy right along, so they shouldn't mind working a little now."

"Jimmy has done more work to-night than I've seen him do altogether in the last six months," said Joe. "So we'd better let him rest himself awhile now. He's apt to get sick if we don't."

"Well, I guess this paper has soaked up all the wax it's going to, so we can go ahead with the rest of it," said Bob, as he started fishing squares of impregnated paper out of the saucepan.

He laid one sheet on one of the blocks that Jimmy had cut out, and on top of that laid a sheet of tinfoil, then another sheet of paper and one of tinfoil, alternating in this way until he had a number of sheets lined up. The little tabs or projections on each sheet of tinfoil he arranged

in opposite directions, so that half of them could be attached to a wire on one side of the condenser and half to a wire on the other side. Then he placed the other wooden block on top of the whole thing, passed the four screws through, one at each corner, and tightened them up evenly. This squeezed all superfluous paraffine from between the plates, and held the whole assembly very securely and neatly.

"That looks fine so far," said Jimmy, critically. "But how do you mean to connect up all those tabs on the plates?"

"I guess about the only way will be to solder them," replied Bob. "I used to have a soldering iron around here somewhere." He rummaged in the big drawer under the bench and soon produced the iron, which he then proceeded to heat over a gas flame.

"While that iron's heating, I might as well follow Jimmy's example and rest," said Bob, throwing himself down on the sofa. "I've been thinking we haven't heard much lately of Buck Looker or any of his gang. Has anybody heard what he's up to now?"

"I saw him only this afternoon," said Joe. "He had Lutz and Mooney with him, of course, and they all looked at me as though they'd like nothing better than to heave a brick at me when I wasn't looking. Buck asked me how the wire-

less 'phone was coming along, and when I told him that we had our aerial up and expected to be receiving stuff within a few days, he seemed surprised."

"What did he say?" asked Herb.

"Oh, he just predicted that we'd never get it working, and as I didn't feel like arguing with him, I started on. I hadn't gone far though when that little sneak, Terry, yelled after me: 'Hey, Atwood, don't forget that all that goes up must come down.' The others snickered, and I had half a mind to go back and make him tell me what he meant. But then I thought he wasn't worth bothering with, and I went on home. What do you suppose he meant, anyway?"

Bob thought a moment before replying.

"You say you told him that we had our aerial up?" he asked, at length.

"Yes, I did tell him that."

"Well, it would be just like them to try to pull down our wires, if they thought they could get away with it. Maybe that's what Terry meant about 'all that goes up must come down.' What do you think?"

"Say!" exclaimed Joe, leaping to his feet, "I'll bet that was just what he meant, the little sneak. But he'd never have nerve enough to try anything like that himself."

"Maybe not. But I think Buck Looker

might," said Bob. "If he does, I only hope I'll have the luck to catch him at it."

"Those fellows need a good licking, and it's up to us to give it to them," said Herb indignantly. "I'm game to do my share any time."

"Oh, well, it may have been just some nonsense of Terry's. But we'd better be on our guard, anyway," said Bob, rising to get the soldering iron. "Whew! but this is hot now, all right. I'll let it cool a bit, and get the condenser ready for soldering."

CHAPTER XIII

THRASHING A BULLY

STRIPPING a length of copper wire, Bob nipped off two short lengths with his pliers and fastened them to opposite sides of the condenser with small staples. Then he brought all the tinfoil plate terminals on each side in contact with the wire on that side, and connected the terminals with their respective wires with a small drop of solder on each. Then he produced a roll of ordinary bicycle tire tape and wound the whole thing neatly in this, leaving only the ends of the two copper wires projecting a distance of perhaps a quarter of an inch.

"There!" he exclaimed, "we can solder our other wires up to them when we come to connect up the set. It isn't very fancy, but it ought to do the work."

"Gee, Bob, you must have been studying up on this," said Jimmy. "To look at your work, any one would think you'd been doing this all your life."

"I did look it up after you fellows went home last night," admitted Bob. "This condenser isn't made just the way they say, but the principle is the same, and I guess that is the main thing."

"We won't worry about how it's made if it only works," said Joe, "and I guess it will do that all right."

"We'll hope so, anyway," said Bob. "But there's only one way to find out, and that's to hook our set up and see if we get signals through. And if we do—oh boy!"

"I'll bet it will work like a charm," said Jimmy enthusiastically. "We haven't got to make much more now, have we?"

"We've got to make a panel and mount all these inventions on it," said Herbert.

"That won't take very long," said Bob. "Of course, we can't do it to-night, but to-morrow's Saturday, and if we get started early we may be able to fix things up so that we can hear something to-morrow night. Saturday night is the time they usually send out the biggest number of musical selections, and if we have luck we may be able to listen in on them."

"Wow!" exclaimed Herb. "Won't that be the greatest thing that ever happened? You can't start too early to suit me."

"Nine o'clock's early enough," said Bob. "Everybody come around here then and we'll

make things hum. There's still plenty to do, but we ought to get it finished before that."

The boys were so excited at the prospect of actually operating their set the following evening that they could hardly sit still two minutes at a time. They laughed and joked and speculated on what would be the first thing they would hear through the air, and finally Bob's guests started home in an hilarious mood.

Bob himself cleaned up his bench a bit after the others had gone, and then went upstairs to his bedroom, which had a window in the rear of the house. He had just started to undress when he thought he heard a peculiar noise outside. At once the thought of what Joe had said about his encounter with Buck Looker and his companions leaped into his mind, and he crossed swiftly to the window and looked out.

It had been cloudy all the evening, but now the clouds were beginning to break away, allowing bursts of moonlight to shine through at intervals. When Bob first looked out of the window, the moon was obscured by a ragged patch of cloud and he could barely make out the dim outline of the barn. But as the cloud passed on and the moon began to shine through the thinning fringe of vapor, Bob saw an indistinct figure on the roof, and as the moon came out more strongly he could see that the figure was tinker-

ing with the end of the aerial that was fastened to the barn.

Bob had no difficulty in recognizing Buck Looker, and without more ado he made for the back stairs leading down to the kitchen. Hot rage was in his heart and a resolve to have it out with the bully once and for all. Noiselessly he unfastened the kitchen door and passed out into the night, approaching the barn with as little noise as an Indian.

Buck Looker was entirely unconscious of his approach, and was still fussing with the aerial when Bob's voice reached him, pleasant enough, but with a steely note in it that almost made the bully lose his hold on the roof.

"Hello, Buck!" said Bob. "What are you doing up there?"

For a few moments the shock of hearing Bob's voice so unexpectedly unnerved Buck completely, and he could do nothing but peer down at Bob with an expression of guilt and dismay on his coarse face.

"Why—why——" he gasped at last, making an effort to pull himself together. "Why, you see, Bob, I—I just thought I'd like to see how you fastened this thing up. Lutz and I were thinking of putting one up ourselves, and we wanted to find out how to do it," he went on, glibly.

"Come on down off that roof and take your medicine," said Bob, ignoring this flimsy excuse. "You've had a licking coming to you for a long time, and now you're going to get it."

"Maybe you'll be sorry when I do come down," blustered Buck. "You let me alone though, and I won't hurt you."

"Shut up and come down," said Bob grimly. "You've got to come down sooner or later, and you can bet I'll be waiting here for you when you arrive."

The bully hesitated for a time, but his position on the roof was precarious, and he saw that Bob was in earnest and meant to wait for him. He summoned up what little courage he could, therefore, and came slowly down a ladder that he had reared against the side of the barn furthest from the house.

Bob waited until Looker was fairly on the ground before making a move. While descending the ladder Buck had made up his mind to run for it as soon as he reached the ground, for he had little liking for an encounter with Bob, although many times he had talked big about what he was going to do to him some day. But Bob had no intention of letting him escape so easily, and as Buck put his foot on the ground and turned with the intention of running, Bob was on him with the fury of a wildcat. Buck was prepared

for this too, and when he saw that he was fairly cornered started to fight back.

Looker was bigger and heavier than Bob, and for a time held his own, but Bob had the memory of more than one wrong to avenge, and a gallant spirit that took no heed of blows received so long as he could punish his enemy.

For many minutes they fought back and forth, giving and taking in fierce fashion. Buck landed one or two heavy blows, but Bob only shook his head and bored in more fiercely than ever. He rained blows on the retreating bully, who was soon getting enough and more than enough. At length Bob saw an opening, and quick as a flash a fist shot up and caught Looker square under the jaw. The bully's head rocked back, his knees sagged under him, and he dropped limply to the ground. Panting, Bob stood over him, waiting for Looker to get to his feet again, but when after a few seconds the bully opened his eyes, there was no sign of fight left in them.

"Get up, you big blowhard!" panted Bob. "I'm not through with you yet."

But Buck Looker was through, abjectly and entirely through.

"Have a heart, Bob," he whined. "I don't want to fight any more. My jaw feels as though it was broken."

"I hope it is!" said Bob. "You big bully!

What do you mean by climbing up on my barn and trying to wreck my aerial?"

"I won't ever try to monkey with it again, honest I won't!" whined Buck.

"You'd better not," advised Bob grimly. "And when you see your friends, tell them I'll do the same to them that I've done to you if they come around here. They'd better keep off these premises unless they're looking for trouble."

"I'll tell them to keep hands off," promised Buck, nursing his injured jaw. "Will you promise not to hit me if I get up?"

"Yes, get up and get out of here," said Bob, disgustedly, and he turned his back contemptuously on the bully and started for the house. As he turned his back, Buck scrambled to his feet with a look of malignant hatred on his face and looked about him, apparently in search of some object he could use as a weapon. Fortunately there was nothing handy that he could use as such, and after stealthily shaking his fist at Bob he sneaked off toward town, one hand still holding his injured jaw.

After washing his face in cold water, Bob saw that he had received only a few minor scratches and bruises.

"I guess I taught that big bully a lesson that he won't forget in a hurry," he reflected. "It will be a long time before he or any of his sneak-

ing friends will come tampering with our wireless again. He's had that licking coming to him for a long time, and I'm glad I was lucky enough to be the one to give it to him."

Tired out by the encounter, Bob turned in and slept soundly until awakened by the morning sun streaming in through the open window.

CHAPTER XIV

ON THE VERGE

Bob felt sore and stiff as a result of the moonlight battle, but he showed little visible sign of it, although there was enough to excite questioning at the breakfast table. Bob narrated what had taken place, and the family was very indignant over Buck's invasion of their property.

"If you hadn't given young Looker such a sound trouncing I would make a complaint to his father," said Mr. Layton. "But under the circumstances I guess there is no need to say anything further about it. His misdeeds seem to have brought their own punishment somewhat sooner than is usual," he added, with a twinkle in his eye.

"Yes, I don't think he'll come bothering around here in a hurry, Dad," said Bob. "I always thought he had a streak of yellow in him, and now I'm sure of it."

"Most bullies have," observed Mr. Layton, as he rose to go down to the store. "I'm glad you caught him at it before he had a chance to do any

damage, because I'm getting interested in that radio business myself. If you boys really get it going with the apparatus that you've made yourselves you'll deserve a lot of credit."

"Well, we'll soon know whether it works or not," said Bob. "We hope to have it in shape to test out to-night."

"So soon?" said Mr. Layton, surprised. "That will be fine! I hope you won't be disappointed," and he went out on his way down to the store.

He had been gone hardly half an hour when Bob heard a cheerful chorus of whistles outside, and knew that his friends had arrived bright and early, as they had promised.

"Here we are, right on the job," said Jimmy, as Bob opened the door for them. "But say, what's happened to you? You look as though you'd been in a fight."

"There's nothing surprising about that, because I have been in a fight," replied Bob, grinning.

"With whom?" they all asked at once.

"An old friend of ours—dear old Buck Looker," responded Bob.

"Well, what—what—when did you see him to fight with him?" stuttered Jimmy.

"It all happened last night after you fellows had gone home," said Bob, and then gave them an account of how he had surprised the bully and the fight that had followed.

"Well!" exclaimed Joe, drawing a long breath when Bob had finished, "I'm glad you gave him a good licking, Bob. I envy you because you had the chance first. I'd like to get a look at Buck now."

"I imagine he'll keep out of sight for a few days," returned Bob. "I don't think I improved his beauty any."

"I wonder if he had time to damage the aerial any," said Herb. "Have you taken a look at it yet, Bob?"

"No, I haven't been up," said Bob. "We might do that now, I suppose."

Accordingly the four boys climbed up on the barn, using the same ladder that Buck Looker had used the night before. They found that Buck, with his customary lack of brains, had failed to provide himself with a pair of wire cutters, with which he could have easily clipped the aerial, but instead had tried to unwind the wire from the insulator eyelet with his fingers. He had succeeded in getting it partially unfastened before Bob had interrupted him, but it took the boys only a few moments with a pair of pliers to rewind it, leaving everything as strong as before.

"That just shows how little brain power that fellow has," said Joe. "What good would it have done him if he had got the aerial down?

It wouldn't have taken us long to put it up again."

"Just for the satisfaction of boasting about it, I suppose," said Herb. "But I guess he won't say much about this affair. He'll calm down for some time to come, anyway."

"We'd never have heard the last of it from that bunch if they had been able to put something over on us," said Bob. "But never mind that crowd now. Let's get to work on our panel and see if we can't get things hitched up in time for the Saturday evening concert. I'm crazy to get the thing actually finished now."

"No more than I am," said Joe. "Let's go!"

His three chums all felt very much at home in Bob's workroom, and knew where to find the various tools almost as well as Bob did himself. Jimmy was given the job of sawing a panel board out of an oak plank, while the others busied themselves with stripping the insulation from lengths of wire and scraping the bared ends to be sure of a good, clean connection. Bob also cleaned and tinned his soldering iron, in preparation for the numerous soldered joints that it would be necessary to make.

"It seems to me you rest an awful lot in between strokes, Doughnuts," said Herbert to that perspiring individual. "Why don't you keep right on sawing until you get through? It seems

to me that would be a lot better than the way you're doing it."

"If you don't like the way I'm doing this, just come and do it yourself," was the indignant reply. "I'd like to see you saw through twenty inches of seven-eighths oak without stopping. You always seem to get all the soft jobs, anyhow. Whenever there's anything real hard to do, like this job, for instance, it gets wished on me."

"That's because we know you like hard work," said Bob, laughing.

"Well, I get it whether I like it or not," complained Jimmy. "But it's almost done now, so I'll finish it quickly and prevent any of you fellows having to do some real work."

"Jimmy's certainly good at that, you have to admit it," said Joe. "I could just stand here all day and admire the way he does it."

But for once the fat boy refused to rise to the bait, and kept doggedly on until at last he had a neat twenty inch square cut out of the big plank.

"There you are, Bob," said Jimmy, panting. "Now see if you can't find some heavy job for these two Indians here."

"I'd like to, first rate," laughed Bob, "but I guess you've about finished up the last of the hard jobs. Of course, we've still got to drill a lot of holes in that piece of wood, but that's easy enough."

"If you give me your word it's easy, I'll tackle it," said Herb. "Where do we want the holes, Bob?"

"I don't know yet," said Bob. "We've got to arrange the different parts on the panel first, and find out just where we want them before we drill a single hole. I don't want to have to change things around after we put holes in the board and spoil the appearance of it."

He laid the board on the bench, and arranged the tuning coil, the crystal detector, the condenser, and the terminals for the head phone plugs in what he thought should be their proper positions, and then called for advice on this layout.

"If anybody can think of a better way to set these things up, let him speak now or forever hold his peace," said he.

"That looks all right to me," returned Joe, eyeing the outfit critically. "But we'll have to raise the panel up an inch or two so as to give room underneath for wires and connections, shan't we?"

"Right you are!" exclaimed Bob. "There's another job for you, Jimmy. We'll have to have two cleats to go underneath and raise the whole business up."

"I thought it was about time for something else to come along for me," grumbled Jimmy. "Just

when I was thinking of lying down and resting, too."

"Oh, that's nothing," laughed Herb. "There never is a time when you're not thinking of lying down and resting, so don't let that worry you."

"Of course there are other times," said Joe, while Jimmy was still struggling to find a crushing answer to Herb's attack. "I'm surprised at you, Herb! How about all the times he's thinking of getting up and eating?"

"Gosh, that was a bad mistake," said Herb, with mock seriousness. "I did you an injustice, Doughnuts, and I apologize."

"You two will never get to be old," said Jimmy, picking up his trusty saw. "You're altogether too smart to live, I'm afraid."

"Oh, I don't think there's any need to worry about that," said Bob, casually, coming to Jimmy's aid. "I think myself they'll probably live to be a hundred."

"Wow!" exclaimed Joe. "That was a wicked wallop, Bob."

"It's no more than you deserve," said Jimmy. "A good wallop with the business end of a gas pipe would be about the best thing that could happen to some people."

"I'm glad he doesn't mean us, Joe," said Herb, with a wink at his friend.

"Never mind whom I mean," said Jimmy.

"Here are your cleats, so you can get busy and screw them on to the back of that panel. I'll lie down on the couch and watch you to see that you don't make any mistakes."

"No danger of that," said Herb. "I couldn't make a mistake if I tried. Wait till I get hold of a screw driver and watch my speed."

"You'll probably make a mistake without trying," said Jimmy, "but I suppose there's no use trying to give you good advice, so go ahead."

However, Herb justified his modest estimate of himself this time, for he soon had the cleats strongly fastened to the back of the panel, raising it two inches, which gave plenty of clearance for wires and screw heads underneath.

"That will make a better job of it, anyway," said Bob. "I was figuring on running the wires on the top side, but if we put them underneath it will look neater, although it will take longer to do it."

"We might as well do it up brown now that we've got this far," said Joe, and the others were of the same opinion.

The boys arranged the various pieces of apparatus to their satisfaction, and then drilled holes through and bolted them securely to the back. This also took a little more time than merely to screw them to the face of the panel, but made a more secure and lasting piece of work.

They were still drilling holes and clamping down nuts when Mrs. Layton called down to tell them that lunch was ready.

"Gosh! is it lunch time already?" exclaimed Joe. "It seems as though we had hardly got started yet."

"I guess it is, just the same," said Bob. "Let's wash our hands, and eat."

"This seems like rubbing it in, though," protested Herb. "We've almost been living here at your house lately, Bob, and now we're putting your mother to the trouble of getting lunch for us. I think we ought to go home and come around later."

"Oh, nonsense," said Bob. "Mother's got everything all ready now, and she'd feel bad if you didn't stay. Come on up," and he set the example by making for the stairs.

"Oh, well, if you insist," said Herb. "But I bet when Mrs. Layton sees what we do to the eats, she'll never ask us again."

"Oh, she's used to seeing them disappear pretty fast," said Bob, "and I don't think anything will surprise her now."

Mrs. Layton made the outside boys welcome with a few cheery words, and all sat down to a lunch in which fresh sliced ham, hot biscuits, and honey played a conspicuous part. Mrs. Layton was famous as a good cook, and it is certain that

the present patrons of her art did not lack in appreciation. Before they got through, the table was swept almost clear of eatables, and even the insatiable Jimmy appeared satisfied, so much so that he appeared to have difficulty in rising with the others.

"I guess we don't have to tell you how much we enjoyed everything, Mrs. Layton," said Herb. "Actions speak louder than words, you know."

"I'm glad you liked it," she said. "I guess you'll all be able to get along till supper time now," she added, with a smile.

"Let's go out on the grass awhile," proposed Jimmy. "I've got to lie down and rest a bit before I can do anything else. You slaves can work if you want to, but not for little Jimmy."

It must be confessed that the others felt about the same way, so they all went out and lay on the soft grass under a big apple tree that grew near the kitchen door.

"Ah, this is the life!" sighed Jimmy, as he stretched out luxuriously on his back and gazed up at the cloud-flecked sky.

"It isn't so bad," admitted Bob, biting on tender blades of young grass. "But I'd enjoy it more if we had our outfit together and working."

"It won't take long to finish it now, do you think?" asked Joe.

"Not unless we strike a snag somewhere," said

Bob. "After we get everything assembled, we've still got to run our leading-in wire down to my bedroom. But I don't think that will take us very long."

"By ginger, I just can't loaf around until we do get it working!" exclaimed Joe, springing to his feet. "Come on, fellows, let's get busy. We can take it easy after we have everything fixed up."

"I'm with you," said Bob. "I feel the same way myself."

Herb jumped up too, but the only sound from Jimmy was a raucous snore ending in a gurgle.

"Poor old Jimmy!" said Bob. "We've had him working hard the last few days, and I suppose he's tired out. Let him sleep awhile."

So Jimmy was left to blissful slumber, and the others returned to their fascinating task.

CHAPTER XV

THE FINISHING TOUCH

THE three chums set to work with a will, cutting, stripping, and soldering wires, and while the afternoon was still young they made their last connection and found themselves possessed of a real honest-to-goodness radio receiving outfit, not quite so beautifully finished and polished off as a set bought readymade in a store, perhaps, but still serviceable and practical.

"Hooray!" shouted all three together, so loudly that the sound reached Jimmy, still lying on the grass, and roused him from his blissful slumber.

"What's the matter here?" he asked a few moments later, coming sleepily down the stairs. "Is the place on fire, or what?"

"No, but we've got the whole set together at last, and we thought we were entitled to a yell or two," explained Bob.

"Gee, that's fine! I didn't mean to sleep so long. Why didn't you wake me sooner?"

"You seemed to be enjoying that snooze so

much that we hated to disturb you," said Bob. "There wasn't very much you could have done, anyway."

"Well, I certainly feel a lot better," said Jimmy, with a prodigious yawn. "What's the next thing on the program?"

"All we've got to do now is to hook up our leading-in wire and ground wire and we'll be all set," said Bob. "I've got a fine big table in my bedroom, and I was thinking that that would be a fine place to mount all our things and keep them together."

This was agreeable to all concerned, so they repaired forthwith to Bob's room. This was situated on the top floor, and, as it happened, almost under the scuttle leading onto the roof. This made it comparatively easy to connect up with the antenna, as all they had to do was to bring the leading-in wire through the frame of the scuttle, drill a hole through the attic floor and the ceiling of Bob's room, and drop the insulated leading-in wire through. To make it perfectly safe, they surrounded the wire, where it passed through the scuttle and ceiling, with a fire proof asbestos bushing or sleeve. In this work they received some advice from Dr. Dale, who chanced to drop in.

All this work took some time, and it was nearly dark when they had made all their connections, including the ground connection to a water pipe.

On one corner of Bob's big table they had inserted a small knife-blade switch in the leading-in wire, so that the set could be disconnected from the aerial when not in use, or during storms so as to guard against lightning.

When all was finished the boys viewed the result of so many hours of hard work and planning with mingled feelings of delight at its business-like appearance and apprehension that, after all, it might not work.

"Gee, I'm almost afraid to try it," said Bob. "But we've got to find out what rotten radio constructors we are some time, so here goes," and he produced his set of head phones. So did Joe and Herb, but Jimmy was struck with a sudden unpleasant thought.

"Great Scott!" he exclaimed. "I've gone and left my set home. I'll get it and come back as soon as I can," and he dived precipitately out of the room.

"He didn't need to be in such a hurry," laughed Bob. "We could have taken turns with ours."

"Well, let's connect up, anyway, and see if we can hear anything," said Joe. "There's no use waiting until Jimmy gets back. It won't take him a long while, and likely enough he'll be back before we raise any signals, anyway."

"Well, pull up your chairs, and we'll plug in," said Bob, adjusting the ear phones over his head.

"I saw in this morning's paper that the Newark broadcasting station was going to send out an orchestra concert this afternoon, and if our set is any good we ought to hear part of it."

They all adjusted their ear phones and then drew up chairs and inserted the plugs in the spring sockets designed for their reception. They had connected four pairs of these sockets in parallel, so that all four head sets could be used at once.

Now was the crucial moment, and the boys waited breathlessly for some sound to come out of the air to them.

CHAPTER XVI

SWEETS OF VICTORY

Bob set one of the sliders about at the middle of the tuning coil, and set the other—the one connected to the leading-in wire—about opposite. Then he adjusted the sharp pointed wire on the detector until the point was just touching the crystal. Still there was no sound in the ear phones, and the boys looked at one another in bitter disappointment. Bob moved the antenna slider slowly along the tuning coil, and suddenly, faint, but very clear, the boys heard the opening chords of an overture played by a famous orchestra nearly a hundred miles away! Sweet and resonant the distant music rose and fell, growing in tone and volume as Bob manipulated the contacts along the coil. The boys sat spellbound listening to this miracle, to this soul stirring music that seemed as though it must surely be coming from some other world. Hardly breathing, they listened until the last blended chords whispered away into space, and then looked at

each other like people just awakened from a dream.

Bob was the first to speak.

"I think we can call our set a success, fellows," he said, with a quiet smile.

"Bob, that was simply wonderful!" cried Joe, jumping up and pacing about the room in his excitement. "Why, we can sit here and hear that orchestra just as well as though we were in the same hall with it. It seems like a fairy tale."

"So it is," said Bob. "Only this is a fairy tale that came true. I wish Jimmy had been here to listen in with us."

"He's here now, anyway," said a familiar voice, and Jimmy burst into the room, puffing and blowing. "Does it work, fellows? Tell me about it."

"I should say it did work!" replied Joe. "We just heard a wonderful selection played by a big orchestra. It must be the Newark broadcasting station, as they had promised a concert for this afternoon."

"I missed it, then, didn't I?" said Jimmy, with a downcast face.

"Yes, but they'll play something else pretty soon," said Herb. "Plug in with your ear phones, and maybe you'll hear something to cheer you up."

"It will take quite a good deal," said Jimmy,

"after hoofing it all the way to my house and back on the double quick. I'll bet that trip took ten pounds off me, if it took an ounce."

"That won't hurt you any," said Joe, with a total lack of sympathy for his friend's trials. "Hurry up and plug in here, so that we'll be ready for the next number on the program."

"Oh, all right, all right," said Jimmy, adjusting his phones. "If I'm not ready, just tell 'em to wait."

The absurdity of this idea raised a laugh, which was suddenly cut short as the first notes of a rousing march came ringing into the ear phones. Every note was true and distinct as before, with practically no interference, and when the last note had died away the boys rose and as though actuated by one impulse, executed an impromptu war dance.

When they had quieted down somewhat, Bob rushed downstairs and brought his mother up to hear her first radio concert. She was rather incredulous at first, but when the first notes of a violin solo reached her ears, her expression suddenly changed, and when the selection was over she was almost as enthusiastic as the boys themselves.

"That was simply wonderful!" she exclaimed. "I never imagined you would be able to hear anything half as distinctly as that."

"I'll bet you never thought you'd hear anything over our home-made set, now did you?" accused Bob.

Mrs. Layton looked a trifle guilty. "I never thought you'd get it working so soon nor so perfectly," she confessed. "But now that you have, I certainly congratulate you."

They all listened for some time for something else to come in over the aerial, but apparently the concert was over, for they could hear nothing but a confused murmur, with here and there some fragment of a sentence coming out clear above the general confusion. This was probably due to the sending being so distant as to be almost beyond their range. Just before supper time they heard a message from a ship at sea, and Joe, Herb, and Jimmy could hardly tear themselves away to go home to supper. They finally got started, however, promising to return as soon as they could after supper, so as to be in time for the evening concert.

After they had gone, Bob called up Doctor Dale, and told him of the successful outcome of their experiment. The minister was delighted.

"That's great work!" he exclaimed heartily. "So the set works well, does it?"

"Yes, sir, it certainly does," said Bob. "Of course it's not as good as yours, and we can't tune out interference very well. But it does all that

I hoped it would, and more. I wish you could get around to hear it when you get a chance."

"I tell you what I'll do," said the doctor. "I have an expert radio man visiting me here this evening. How would it be if I dropped around some time during the evening, and brought him with me?"

"Fine!" exclaimed Bob, delighted at the prospect of talking with an experienced radio man. "We'll all be looking for you, sir."

Bob was delighted over the doctor's promise, and told his friends about it as soon as they arrived that evening. They were all equally pleased.

"He can tell us just what we need to know," commented Joe. "You can dig a lot of stuff out of books, but lots of times just the question you want answered doesn't seem to be in them."

The boys had just raised the Newark station, and were listening to the first number on the program, a soprano solo, when the minister and his friend arrived. He introduced the stranger as Mr. Brandon, and the latter immediately made himself at home.

"I hear you fellows got your set working first crack out of the box," he said, as they were going upstairs. "You're luckier than I was with my first one, because I had a lot of trouble before I got my first signal through. I fooled around a

long time before I found out what the trouble was, too."

"What was it?" asked Bob.

"I finally found that the water pipes were insulated from the street pipes, as they are in some houses, so that I really didn't have any ground at all, even though my ground wire was connected with a pipe in the bathroom. I might have been looking for the trouble yet if a friend of mine hadn't given me a tip what to look for."

By this time they had reached Bob's room, and Dr. Dale and Mr. Brandon inspected the boys' outfit with great interest.

"Pretty good for beginners, isn't it, Brandon?" said the minister at length, when they had gone over the thing at length and Bob had explained the way they had made the different units.

"I should say so," acquiesced the expert. "They've made up one of the neatest amateur jobs I've seen in a long time. Let's see how it sounds."

He and the doctor donned head phones, and Mr. Brandon manipulated the tuning coil and the crystal detector with a deftness that spoke of long experience. He showed the boys how they might get even clearer and louder tones than any they had yet obtained by adjusting the detector until the best possible contact was obtained with the crystal.

"You could hear better with a more elaborate set, of course," he said, "but you get mighty good results with what you've got. Of course, you're range is limited to less than two hundred miles with this set, and your tuning range is limited, too. But you've made a fine start, and with this as a foundation you can go on adding equipment, if you like, until you have a first class receiving station."

"Yes, and after we get a little more experience, we want to try our hand at sending, too," said Joe.

"Well, that's a more complicated undertaking," said Mr. Brandon. "But there's no reason why you shouldn't, if you are willing to go to the trouble to learn the international code and take an examination. You have to be able to receive ten words a minute, you know, to get a license."

"I suppose you're an expert both sending and receiving," said Bob.

"I ought to know something about it by this time," said Mr. Brandon. "Uncle Sam has me working for him now as radio inspector, so I'm supposed to know something about it."

"Mr. Brandon was with the aviation radio branch of the service during the war," explained Dr. Dale, "and he has seen radio telephony develop from almost nothing to what it is to-day."

"Yes, it was the war that speeded up the growth

of radio," said Mr. Brandon. "It revolutionized war in the air, and made it possible to control the movements of airplanes in a way that had never been dreamed of before."

"You must have had some mighty interesting and exciting work," ventured Herb.

"All of that," admitted Dr. Dale's friend, with a smile. "Once our whole station was wrecked by a bomb dropped on it from an enemy plane. Luckily, we all had time to duck out before the bomb landed, but there wasn't anything left of our fine station but a big hole in the ground and bits of apparatus scattered around over the landscape. There were very few dull moments in that life."

"It doesn't sound very dull," said Bob, laughing.

"I can assure you it wasn't," said the radio expert. "But in the case I was telling you about, our airmen brought down the fellow who had dropped the bomb, which made us feel a little better."

"There's some interesting stuff coming in now," said Dr. Dale, who had been listening in at the receiving set. "They're sending out news bulletins now, and I'd advise you to listen for a bit. It's away ahead of reading a newspaper, I assure you."

"Besides being easier on the eyes," grinned

Mr. Brandon. "Let's hear what it's all about."

Sitting at ease, they heard many important news items of the day recorded. There was a little interference from an amateur sender, but they finally managed to eliminate this almost entirely by manipulation of the tuning coil.

"I know that fellow," said Brandon. "I was inspecting his outfit just a few days ago. He's got a pretty good amateur set, too. He's located in Cooperstown, not twenty miles from here."

"My, you must know every station in this part of the country!" exclaimed Joe, surprised.

"It's my business to know them all," said Brandon. "And if anybody takes a chance and tries to send without a license, it's up to me to locate him and tell him what's what."

"It must be hard to locate them, isn't it?" asked Jimmy.

"Sometimes it is," returned the radio inspector. "I'm tracing down a couple now, and hope to land them within a few days."

The little company had some further interesting talk, and then, as it was getting rather late, Dr. Dale and his friend rose to go.

"I'm glad to have met all you fellows," said the radio expert, shaking hands all around. "If there's anything I can do to help you along at any time, Dr. Dale can tell you where to find me, and I'll be glad to be of service."

The boys thanked their visitor heartily, and promised to avail themselves of his offer in case they found that they needed help. Then Bob saw the visitors to the door, and returned to his friends.

"We're mighty lucky to have met a man like that, who knows this game from start to finish," said Joe. "I'd give a lot to know what he does about it."

"You never will know as much," said Jimmy. "Mr. Brandon is a smart man."

"Meaning that I'm not, I suppose?" said Joe. "Well, there's no need of my being smart as long as you're around with your keen young mind."

"It's nice of you to say so," said Jimmy, choosing to ignore the sarcasm in Joe's tone. "I never expected to hear you admit it, though."

"I'll have to get you two Indians a pair of boxing gloves, and let you settle your arguments that way, pretty soon," came from Bob.

"Nothing doing," said Jimmy. "Boxing is too much like work, and it's time to go home, anyway," and he rose to look for his hat. "Anybody coming my way?"

"Well, if there were any more messages coming in, I'd ask Bob to let me stay all night," said Joe. "But as it is, I suppose I might as well go, too. Coming, Herb?"

"Yes, I suppose I'll have to."

"Not at all," put in Jimmy. "I'm sure Mrs. Layton would just love to have you two fellows planted on her for a life time."

"Nothing doing!" declared Bob, laughing.

In a few moments three tuneful whistlers were making their way homeward, with hearts elated at the success of their first venture into the wide field of radio telephony.

CHAPTER XVII

THE FERBERTON PRIZE

For several days nothing of special interest happened in Clintonia. Buck Looker made his appearance about the streets, one eye covered by a black patch. This he explained to his cronies by telling them that he wore the patch to keep out the sun, but even they had to take this with a large grain of salt, as Bob's friends took pains to let the real cause of Buck's trouble be known. Buck knew that he was not 'getting away' with his excuse, and the knowledge made him more surly and unpleasant than before. In the course of a few days he was able to discard the patch, but unfortunately he could not discard his mean and revengeful nature so easily, and his mind was continually occupied with plans to "get even."

"We'll put that crowd out of business some way, you see if we don't," said Buck to Carl Lutz.

"I'd like to do it, all right, but I don't see just how we're going to manage it," replied Lutz. "If Bob Layton can lick you, he can lick any of our

bunch, so we don't want to get into trouble with them until we've got a sure thing."

Buck agreed heartily with this unsportsmanlike attitude, but had more confidence in fortune.

"Don't worry about that," he said. "We'll get our chance all right! And then won't we rub it into Bob Layton and his crowd!" and his face wore even a more ugly and sinister look than usual.

For the next few days the boys' radio set was in much demand. Of course all their immediate relatives had to listen in, as it is called, and they also invited many of their friends, both boys and girls, to try it.

"Oh, it's too wonderful for anything," declared Joe's sister Rose. "To think of getting all that music from such a distance!"

"Yes, and that splendid sermon Sunday afternoon!" exclaimed Mrs. Plummer. "I declare, if Dr. Dale doesn't look out they'll make it so nobody will have to go to meeting any more."

"I've certainly got to hand it to you boys," was Doctor Atwood's comment. "I didn't think you could really do it. This radio business is going to change everything. Why, a person living away off in the country can listen in on the finest of concerts, lectures, sermons and everything else. And pick up all the very latest news in the bargain."

One day Bob had to go out of town on an errand for his father and he was allowed to take Joe along. At the out-of-town railroad station they quite unexpectedly ran into Nellie Berwick. The girl had recovered from the shock of the automobile accident but looked much downcast.

"No, I haven't heard from Dan Cassey yet," she said, in reply to a question from Bob.

"Then he didn't come back?" questioned Joe.

"No—or, if he did, he is keeping in hiding. I guess my money is gone," and the girl heaved a deep sigh.

"The rascal, the dirty rascal!" was Bob's comment, after they had left Miss Berwick. "Oh, how I would like to hand him over to the police!"

"Yes, but give him a good licking first," added his chum.

While Buck Looker was still racking his brains for an appropriate form of punishment for Bob and his chums, a most interesting thing happened to the radio boys. The Representative in Congress of the district in which Clintonia was located, Mr. Ferberton, came out with an offer of a prize of one hundred dollars for the best amateur wireless outfit made by any boy in his district, and a second prize of fifty dollars. It was stipulated that the entire set, outside of the head phones, must be made by the boy himself, without any assistance from grown-ups. A time limit

of three weeks was allowed, at the end of which time each set submitted was to be tried out by a committee composed of prominent business men and radio experts, and the prizes awarded to those getting the best results and making the neatest appearance.

It may be imagined what effect this offer had on the four radio boys. The announcement was made at the high school one day, and from that time on the boys were engrossed with the idea of winning the coveted prize.

"Just think of the honor it would be, let alone the hundred dollars," said Bob. "Whoever wins that prize will be known through the entire State."

"I wouldn't care much who got the honor, so long as I got first prize," said Jimmy, avariciously. "What I couldn't do with all that money—yum, yum!"

"Yes, or even fifty dollars wouldn't be anything to sneeze at," said Joe. "I give you fellows notice right here that you'll have to step mighty lively to beat yours truly to one of those fat plums."

"Gee, you'll never have a chance," said Jimmy. "Why, my set will be so good that it will probably win both prizes. Nobody else will have a look in."

"All you'll win will be the nickel plated neck-

tie for trying," said Herb. "If you really want to see the winner of the first prize, just gaze steadily in my direction," and he grinned.

"I'm not saying anything, but that doesn't prove that I'm not thinking a lot," said Bob. "Never leave little Bob Layton out of it when there's a prize hanging around to be picked."

"It would be just like your beastly luck to win it," said Jimmy.

"There won't be much luck about this, I guess," said Joe. "By the time the judges get through picking the winner, the chances are it will take a pretty nifty set to pull down first prize—or second, either, for that matter," he added. "There's a lot of fellows trying for it, I hear."

"Well, as far as we four go, we all start even," continued Bob. "All that we know about radio we learned together, so nobody has a head start on the other."

"That doesn't help me much," said Herb. "What I need is a big head start. I think I'll enjoy myself working the set we have already, and let you fellows slave your heads off trying for prizes. I know I'd never win one in a thousand years, anyway."

"Oh, you might—in a thousand years," put in Jimmy, wickedly; "not any sooner than that, though."

"Oh, who asked you to put in your two cents' worth, you old croaker?" said Herb, giving Jimmy a poke in his well padded ribs. "I'll win that prize just as well by not working as you will by working. You know you're too fat and lazy to make up a set all by your lonesome."

"I'm not too lazy to try, anyway," returned the fat boy, "and that's more than some people can say."

"He's got you there, Herb," laughed Bob. "Why don't you start in and make a try for it, anyway?"

"Nothing doing," said Herb. "If I took the trouble to make a wireless outfit good enough to cop that prize, I'd expect them to pay me a thousand dollars for it instead of a measly little hundred."

"To hear you talk, anyone would think that hundred dollar bills grew on trees," said Joe. "I'll bet any money you never saw a hundred dollars all at one time, in your life."

"To tell you the truth," said Herb, "I don't really believe there's that much money in the whole world. I must admit I've never seen it, anyway."

"You'll see it when I show it to you," said Jimmy, with more show of confidence, it must be admitted, than he really felt.

"Well, remember we're all pals," said Herb. "If you win that prize, Jimmy, I get half, don't I?"

"Yes, you don't. I might blow you to an ice cream soda, but outside of that, my boy—nothing doing."

One day the hardware dealer of whom they had purchased their supplies called Bob, Joe and Jimmy into his establishment.

"Got something to show you," he declared importantly. "New box set, just from New York, and sells for only twenty-two fifty. Better than any you can make. Want to try it? There's a concert coming in from Springfield right now."

"Yes, sir, we'd like to try it, and it's good of you to let us," answered Bob. "But we believe in making our own sets. That's more than half the fun."

"Yes, but just wait till you hear this box set," urged the dealer. "Then maybe you'll want to own one. A professional set is always better than an amateur one, you know."

The boys didn't know but they did not say so. They followed the man to a back room of his establishment, where the box set rested on a plain but heavy table.

"There are the ear phones, help yourselves," he said. "I've got to wait on that customer that just came in."

The three radio boys proceeded to make themselves at home around the table. They adjusted the ear phones and listened intently. There was not a sound.

"Guess the concert is over," observed Doughnuts.

"Wait till I make a few adjustments," put in Bob, and proceeded to tune up as best he could. He had been reading his book of instructions carefully of late, so went to work with a good deal of intelligence.

"There it is!" cried Joe, as the music suddenly burst upon their ears. "Listen, fellows! They are playing Dixie!"

"And it sounds mighty good," added Jimmy enthusiastically.

"But no better than it would on our set at home," put in Bob, quickly.

"Not a bit," added Joe, loyally.

The three lads listened to another selection and then the storekeeper joined them.

"Isn't that grand?" said he. "I'll bet you can't make a box as good as that."

"Maybe we'll make something better," said Bob. "You come up to our place some day and listen to what we have."

"Then you don't think you want a box?" And the shopkeeper's voice indicated his disappointment.

"Not just yet anyway," answered Bob.

"We'd rather buy the parts from you and make our own," added Joe. "Besides, we want to try for the Ferberton prizes."

"Oh, that's it. Well, when you want anything, come to me," concluded the dealer.

CHAPTER XVIII

FRIENDLY RIVALS

THE radio boys, Herb excepted, finally decided each to make his own set without any consultation with any of the others, and submit it to be judged strictly on its merits.

"Three weeks ought to give us plenty of time," said Bob. "I'm going to do a lot of experimenting before I start in to make the real set. Of course, the one we've already got belongs to all of us equally, and you fellows know you can come and use it any time you feel like it."

"Your mother will be putting us out if we spend much more time at your house," replied Joe. "It seems as though we have just about been living there lately."

"Oh, don't let that worry you," said Bob. "You know you're welcome at any time. Besides, we won't have to put all our time on the new sets, either. We can have plenty of fun in the evening with our present one."

The boys finally agreed to build their sets each

by himself, and to say nothing about any features or improvements that they might incorporate in it. They were all enthusiastic over their chances, although they knew that the winners would have to overcome a lot of first-class opposition.

Herb felt sorry at times that he had not started a set of his own, but his was an easy-going disposition that took things as they came, and while the other boys were studying all the books they could find on the subject and consulting Dr. Dale, Mr. Brandon having departed, he was listening to music and talk over the original set, and enjoying himself generally.

"You go ahead and have all the fun you want now," said Joe one time, when Herb was teasing him about working so hard. "My fun will come later."

"Yes—if you win the prize," said Herb. "But if you don't, you won't be any better off than I am, and you'll be out all your work besides."

"Not a bit of it," denied Joe. "Even if I don't win either prize, my set will be returned to me after the judging is over, and I'll have that to show for my trouble, anyway."

"Maybe you will, if they don't tear it all apart while they're looking it over," said Herb.

"Aw, forget it," advised Joe. "If I don't get anything out of it but the experience, I won't think that I've wasted my time."

"Well, that's the spirit, all right," said Herb. "Go to it. But you ought to have heard the concert I heard last evening while you slaves were working your heads off."

"Yes, but when I get this outfit of mine working, I'll be able to hear everything a lot better than you can with the set we've got now," said Joe. "I've got some good kinks out of a radio magazine that I'm going to put in mine, and it's going to be a regular humdinger."

"Oh, all right, all right," said Herb, laughing. "That's the very thing that Jimmy was telling me only this afternoon. He's putting a lot of sure fire extras on his set, too. I don't think there will be enough prizes to go around."

"I don't care whether there are or not, so long as I get one," said Joe, with frank selfishness. "One is all I want."

"That's probably exactly one more than you'll get," grinned Herb. "But you may astonish us all by working up something really decent. Funny things like that do happen, sometimes."

" 'It's easier to criticize than to create,' " quoted Joe. "Likewise, 'he who laughs last, irritates.' If those two wise old sayings don't hold you for a while, I'll try to think up a few more for you."

"Oh, don't bother, that's plenty," laughed Herb. "It doesn't take many of those to satisfy me."

"Well, I'll have to leave you to your troubles," said Joe. "Now that I've got this idea in my noodle, I won't be able to rest until I get it worked up."

"Say, wait a minute," said Herb. "I heard a swell joke to-day, and I know you'll enjoy it. There was an Irishman and a Jew——" but at this formidable opening Joe rushed out, slamming the door behind him. "Well, it's his loss," thought Herb. "But it is a crackerjack story, just the same. I'll have to go and find Bob and tell it to him."

He found Bob hard at work at his bench downstairs.

"Hey, Bob, want to hear a good joke?" he asked.

"Nope," said his friend, with discouraging brevity.

"Gee!" exclaimed Herb, "you're as bad as Joe. You neither of you seem to appreciate high-class humor any more."

"Oh, we appreciate high-class humor all right," said Bob, with a wicked grin. "It's only your kind that we can't stand for."

"Bang!" exclaimed Herbert. "That settles it. Any one of you knockers who wants to hear that story now will have to come to me and ask for it."

"That's all right, Herb. Just you hold on to

it until we do. Maybe it will improve with a little aging."

"This story is so good that it can't be improved. But I'm going home now, so if you want to give yourself the pleasure of hearing it, you'd better say so right away."

"No, I'll get along somehow without it," answered Bob. "But maybe Jimmy would like to hear it. Have you tried it on him?"

"No, and what's more, I'm not going to. I've lost my confidence in that story now. I guess it can't be so good after all."

"Probably not," agreed Bob gravely.

"Oh, get out!" cried Herb. "I'm going home!" and he departed indignantly, slamming the door behind him.

CHAPTER XIX

A SPLENDID INSPIRATION

"SAY, fellows, I've been thinking about something," said Bob seriously, so seriously, in fact, that the three boys who had been lolling on the grass turned over and regarded him with interest.

"Gosh, did you hear what he said?" asked Herb, with a grin. "He's got an idea, fellows. Hold your hats, I bet it's a bear."

"Spill it, Bob," came from Jimmy, lazily.

"Gee, he sure is a wonder, that boy," said Joe, regarding his friend admiringly. "I've never known him to run out of ideas yet. Not but what some of 'em are rotten," he added, grinning. The next minute he dodged a clump of moist earth thrown his way by the good-natured Bob, the result being that the missile landed square upon Jimmy's unoffending head.

The boys roared while poor Jimmy patiently brushed the dirt off, inquiring in injured accents what the big idea was, anyway.

"Good work, fellows," crowed Herb joyfully. "That's bully slap-stick work all right. You have a movie star beat a mile already."

"Say, cut out the comedy, will you, Herb?" asked Joe impatiently. "I want to hear about this great idea of Bob's."

"I didn't say it was great, did I?" demanded Bob modestly. "It's just an idea, that's all."

"Well, shoot," demanded Herb laconically.

Bob was silent for a moment, wondering just how he could best express the thought that had suddenly come to him, just a little afraid that the others might laugh at him. And where is the boy who does not dread being laughed at more than anything else in the world?

The day had been unusually warm for the time of the year, and the radio boys, turning their backs upon the town, had started out for a long hike into the woods. The heat, together with a visit to the doughnut jar just before meeting the boys, had wearied Jimmy, and he had been the first to suggest a rest. And so, having come across a talkative little brook, hidden deep in the heart of the woodland, the boys had been content to follow Jimmy's suggestion.

Sprawled on the mossy ground in various ungraceful, though comfortable positions, the boys lazily watched the hurrying little brook, throwing a pebble into it now and then and talking of

the thing that almost always filled their minds these days—their radio outfits.

At last, urged on by the boys, Bob made public his idea.

"Why, I was just thinking——" he said slowly. "I was just thinking how awfully slow things must be for the poor shut-ins——"

"What?" demanded Herb curiously.

Bob frowned. It bothered him to be interrupted, especially when it was hard to express what he felt.

"Shut-ins," he repeated impatiently. "People who can't get out and have fun like us fellows."

"Oh, you mean cripples like Joel Banks," said Herb with relief.

"Gee, did you just find that out?" murmured Jimmy, turning over on his stomach and wondering if he really ought to have eaten that last doughnut. "Some folks are awful stupid."

Herb showed a strong desire to avenge this insult, but Joe quelled the threatened riot.

"Cut out the rough stuff, can't you, fellows?" he asked disgustedly. "Give Bob a chance."

"Well," Bob continued during the temporary quiet that ensued, "I was just thinking what a mighty fine thing it would be for these poor folks who never have any fun if they could have a radio attachment in their own houses so that no matter how crippled they were, they could listen to a

concert or the news, or any old thing they wanted to, without going outside their houses."

"It sure would be fine," said Joe, a little puzzled as to what Bob was driving at but loyally certain that, whatever the idea, his chum was sure to be in the right.

"I don't get you at all," complained Jimmy, finally deciding that he really should have left that last doughnut alone, there was beginning to be a mighty uncomfortable sensation somewhere in the center of his being. "Radio probably would be a fine thing for cripples but, gee, we're not cripples—yet."

"Who said anything about us?" demanded Bob, disgruntled. "I never said we were cripples, did I?"

"Well, spill the rest of it," groaned Jimmy as he shifted from one side to the other in the hope of relieving the pain that gnawed at his vitals. "What's the big idea?"

"I was wondering," said Bob, sitting up and growing excited as his vague plan began to take shape, "if we couldn't get some of these poor folks together and give 'em the time of their lives."

The boys stared at him and Herb shook his head sorrowfully.

"Gone plain loco," he explained to the other boys, with a significant tap on his forehead.

"They say life's pretty hard inside that asylum, too."

"Loco, nothing!" cried Joe, beginning to understand Bob's idea and growing excited in his turn. "You're the one that's loco, you poor fish, only you haven't sense enough to know it. Where would we give this entertainment, Bob? At your house?" he asked, turning to his chum while Herb grinned at the suffering Jimmy.

"Now, they've both got it," he said dolefully.

"Well, I wish 'em joy of it," grumbled Jimmy.

"Why, I thought of that at first," Bob said in reply to Joe's question. "Only with our instruments we have to use the ear pieces so that only a few could listen at a time."

"That would be pretty slow for the rest of them," Joe finished understandingly.

Bob nodded eagerly.

"Sure thing," he said, sitting up and flinging the hair back out of his eyes. "I knew you'd catch the idea, Joe."

"Say, I know what we'll do," broke in Herb excitedly. "How about taking all these poor lame ducks to Doctor Dale's house. He has a horn attachment——"

"And they could all hear the concert at once! Hooray!" cried Jimmy, momentarily forgetting his pain in excitement. "You've got a pretty good head piece after all, Bob."

"Yes, and a minute ago you were laughing at me," said Bob, aggrieved.

"Well, say," cried Joe, who was ever a boy of action, "what's the matter with our getting busy on this right away? Let's go and see Doctor Dale——"

"What's your big rush?" Jimmy protested feebly, appalled by the prospect of immediate action. "There's a lot of things we don't know about this business yet."

"Sure, sit down and talk it over," urged Herb placatingly. "No use gettin' all worked up over this thing, you know. Say," he added, with a sudden light in his eye, "that reminds me of a joke I heard——" But a roar of protest from the other boys drowned his voice.

"Gag him, some one, can't you?" Joe's voice was heard above the uproar. "The last joke he tried to work off on us was so old it had false teeth."

"Gee," cried Herb, finally released and disgruntled. "It's plain to be seen real humor is wasted on this gang."

The boys let it go at that and eagerly plunged into a discussion of the proposed concert.

"Who do we know that we can invite?" Joe asked practically. "The only 'shut in' I know is poor old Joel Banks. He's a fine old boy—went all through the Civil War with colors flying.

He's awfully old now, and so crippled with rheumatism he can't leave the house."

"Fine!" crowed Herb irrepressibly. "Here's the first of our lame lucks."

"Joel Banks isn't any lame duck! I'll have you know that right now," cried Joe hotly. "He's one of the finest old gentlemen you ever want to see, and a hero at that. My dad says he would take his hat off to him any day in the week."

"All right, all right," said Herb quickly. "Don't go off the handle. I didn't know you were so strong for the old boy. Who's next on the list?" he asked, turning to Bob.

"Why," said Bob uncertainly, "I know quite a few poor kids who were crippled in that infantile paralysis epidemic——"

"Sure, so do I," broke in Jimmy, interested. "How about little Dick Winters and his sister?"

"Fine!" cried Bob. "And I know a couple more I could pick up. Now let's see! That makes—Gee, how many is it?"

"About five," Joe figured for him. "That's enough, isn't it."

"Y-yes," said Bob doubtfully. "Only your friend, the old war veteran, might not like to be squeezed in with a lot of kids, that way."

"I can fix that easily," said Jimmy, impor-

tantly. "What's the matter with asking Aunty Bixby?"

"Who's she?" asked Bob, with interest.

"She's an old lady, a sort of spinster, I guess," Jimmy explained. "She lives all by herself, and I guess she gets kind of lonesome sometimes. She's kind of deaf, though," he added doubtfully.

"Deaf!" repeated Bob, with a frown. "How can she listen to radio then, if she's deaf?"

"Oh, she has a trumpet," Jimmy hastened to explain. "She sticks it in her ear like this," and he made a gesture with his hands at the same time distorting his face into such a comical imitation of a deaf person doing his best to listen that the other boys shouted with laughter. "Oh, she can hear, all right," Jimmy finished confidently.

"Well, then, that makes six," said Bob briskly. "Now we've got to make up our minds how we are going to get them to Doctor Dale's house."

"Maybe dad will let me take the big car," said Joe, his eyes shining with the sheer daring of the thought. "He is so crazy about radio himself these days that he will pretty nearly stand on his head to help anybody who takes an interest in it."

"I guess all our dads are bricks about radio," declared Jimmy stoutly. "Mine said the other night he was mighty glad to have a youngster

that had sense enough to pick out something really good to waste his time on."

"Waste, is right," said Herb and then stared upward through the trees as Jimmy's indignant stare was fixed upon him.

"Stop scrapping, fellows," said Bob, jumping to his feet and shaking off some of the twigs and damp earth that stuck to him. "Let's get busy and find Doctor Dale. If he won't let us have his house then this thing is all off."

"Swell chance, his not letting us have his house," said Jimmy, getting painfully to his feet and shaking himself for all the world like a fat puppy dog. "He's the greatest sport going."

"He sure is," Bob agreed as they swung off at a great pace through the woods. "If it hadn't been for him we probably wouldn't have known anything about radio."

For a while they were quiet, their minds busy with plans for perfecting their own radio outfits, their imaginations athrill with anticipation of the wonders they were yet to perform.

Then Herb suddenly broke into their dreams with a very practical question.

"Boys, I just happened to think——"

"'Happened' is right," murmured Jimmy, with a grin.

"Even if Joe does get his dad's car," Herb went on, unmoved, "it's only a seven passenger, and

there will be ten of us, counting the lame ducks."

"Oh, that'll be all right," said Bob confidently. "We'll hire a jitney of some sort down at the livery."

Thereupon they all plunged into a lively discussion of plans for the concert, and so absorbed were they that they found themselves walking down Main Street before they had any idea that they were near the town.

As they neared the big stone church on the corner they espied a familiar figure mounting the steps of the parsonage.

"Hooray!" shouted Bob, starting on a run down the street. "Just in the nick of time, fellows. There's the doctor himself!"

CHAPTER XX

THE TIME OF THEIR LIVES

Doctor Dale heard their shout and waited with his genial smile till the four boys came panting up to him.

"We've got a sort of idea, Doctor Dale," explained Bob, stammering in his eagerness. "And —and we would like to speak to you about it if you have time."

"I can always spare some for you boys," the doctor assured him heartily. "Come on in, fellows, and let's hear about this idea. Something connected with radio, I suppose?"

"Yes, sir," answered Bob, as Doctor Dale opened the parsonage door and the boys crowded eagerly after him into the cozy study.

The doctor listened with interest while Bob outlined the plan to him, assisted by frequent interruptions from the other boys.

And if the chums had expected enthusiasm from this good friend of theirs, they were certainly not disappointed. The doctor was jubilant

over the idea and readily consented to giving his time unreservedly for the purpose of making the affair a great success.

They set the date of the concert for the next day, which was Saturday, and added the names of several others to the list of those to be invited. A few minutes later the minister's callers departed gleefully, a warmer feeling than ever in their hearts for Doctor Amory Dale.

"You've got the right idea, boys," the latter called after them, standing at the top of the steps to see them off. "Give happiness to others and you will find true happiness for yourselves."

So far everything had gone swimmingly, and when the next morning the boys arose to find the sun shining brightly they thought that the fates had been almost too good to them.

"Something sure will happen before night," Jimmy muttered gloomily, as he made his way down to the dining room, from which issued a tempting aroma of bacon. "It's all too good to be true." But then, Jimmy always did feel grumpy before breakfast.

The boys each found his own family as enthusiastic as Doctor Dale had been about the great plan, and Bob's mother even hugged him impulsively as she passed behind his chair. Bob was almost ashamed of the happiness that welled in his heart. Of course a fellow of fifteen was

too big to be hugged as a general thing, but, somehow, one's mother was different.

After breakfast he started down town to see about the jitney, met Joe on the way, and the two boys went on together, talking excitedly of their preparations.

"Dad says I can have the big car and the garage man will run it," Joe informed him gleefully. "Gee, I was never so surprised in my life. All he said was 'take it, my son, and Heaven grant you never want it for a worse purpose.' Great old sport, dad is."

"Gee, that's great," said Bob. "Now if we can only find some old bus that looks as if it will stand up for a mile or two, everything will be dandy."

After much kicking of tires and anxious examination, the boys did actually manage to find a Ford machine that promised, with more or less reservations, to do its duty, and, after engaging it with a driver for one-thirty that afternoon, they walked importantly from the shop, much to the amusement of the garage man.

"Fine set of kids," he muttered, shaking his head admiringly as he returned to the machine that he was repairing. "Always full of pep and ginger whenever you see 'em. They'll go a long way, those kids will."

In spite of various gloomy predictions, at one-

thirty that afternoon there was still not a cloud in the sky and the breath of the sun smote downward almost as hotly as it would in midsummer.

Gayly the four boys started off in the two cars, eager to pick up the poor shut-ins of their acquaintance and give them the time of their lives.

Their first stop was at the lonely little cottage of Joel Banks, Civil War veteran. His housekeeper let them in, a quaint little woman with pink cheeks and white hair and a spotless white apron tied around her comfortable waist.

When the boys made known their errand to her she departed in a flutter of pleased surprise to prepare "the colonel" for his treat. In a few moments more the old gentleman appeared, leaning heavily upon the housekeeper, a stout cane grasped stiffly in his knotted fingers.

He gazed at the boys for a moment with dim eyes, then suddenly a gleam shot into them and he smiled.

"Reckoning on giving me a treat, are you, boys?" he asked. Something must have caught in his throat, for he cleared it hastily. "Well, that's mighty fine of you. Been a long time since anybody took that much interest in old Joel Banks."

Joe introduced his friends in hurried, boy fashion, and a moment later they were helping the old

gentleman out of the house and into the automobile, at the same time pouring into his interested ears such tales of the marvels of radio telephony that it was a wonder they did not talk the veteran deaf.

In the confusion Bob managed to whisper instructions to Joe.

"We'll put the kids in your car," he said hurriedly. "There will be more room for them, and then they won't bother the old folks. And have the man drive slowly," he added. "This old bus isn't long on springs, and I don't want to jolt 'em up too much. Take it easy, Joe."

"All right," agreed the latter, and a moment later they were gliding cautiously over the smooth roads on their way to the home of little Dick Winters and his sister Rose.

The children were deliriously happy at the prospect of a little change and excitement, and there were tears in their mother's eyes as she helped the boys lift the children into the comfortable back seat of the Atwood car.

"God bless those boys!" whispered the woman, as the two cars sped away down the road.

Still further on the boys picked up several more crippled boys and girls, and then turned off a hot and dusty side road to call for Aunty Bixby.

Secretly the boys were a little afraid of this

formidable old woman, and they wondered rather nervously whether or not she would break up the party.

When Jimmy, who was sitting beside Bob in the flivver, pointed out the white, ivy-grown house where the old woman lived, Bob nudged him nervously.

"Remember, you've got to take care of her," he said, noticing that Jimmy himself looked rather worried. "You were the one who spoke about her——"

"Gee, you don't need to rub it in, do you?" growled the fat boy as he squeezed himself through the door and stepped gingerly onto the dusty road. "Better let me go in alone. She might get scared if she saw the whole bunch of us, and maybe she wouldn't come at all."

In his heart Bob thought that that might not be such a terrible thing, but he kept quiet. A fellow ought to be thankful for small blessings. Think how much worse it would be if he, and not Jimmy, were forced to break the news to Aunty Bixby.

The big car came to a stop beside the Ford, and all the boys watched with interest as Jimmy ascended the steps of the porch, rang the bell, and a moment later, disappeared into the house.

But as the time passed and he still failed to

emerge they began to get a little uneasy about him. Finally Bob let himself out of the car and went to consult with Joe and Herb.

They had just about decided to make a raid upon the house and rescue poor Jimmy when the subject of discussion himself appeared, looking very red and flustered and out of sorts.

The boys were about to make a concerted rush upon him, but he waved them back violently.

"She's coming," he said in a hoarse tone somewhere between a whisper and a shout. "Get back there, you fellows."

They got back just in time to see Aunty Bixby herself emerge. Bob gave one look and his heart sank into his boots.

"Gee!" he muttered and there was anger in his eye. "Just wait till I get Doughnuts Plummer alone somewhere."

Meanwhile Aunty Bixby was limping down upon them with all sails set, her stiff silk dress billowing out about her and her little hat set securely on her determined head, while Jimmy puffed along behind her.

With rare presence of mind Bob jumped out, opened the door of the car and offered to assist the old woman. His reward was a cold stare that made him feel like a baby caught with the jelly jar.

"No, thank you, young man," said Aunty

Bixby. "I am quite capable of climbing into this —er—horrible thing, unassisted."

Bob shot a wild glare at Jimmy, who hovered in the background, but at the look of utter misery on the latter's face, even Bob's hard heart was softened.

As the old woman rustled into the car Joel Banks moved over courteously, but there was a gleam of amusement in his eye that puzzled Bob. How could he know that the old gentleman was having the time of his life?

Bob nudged Jimmy, bidding him do his duty and introduce the two old people, and, to do poor Jimmy justice, he really did do his best. But Aunty Bixby could not get the name straight, even with the assistance of her ear trumpet.

"Not that it matters in the least," said the old woman irritably, settling back with a grim expression on her face. "Now if you will take my advice and get started, young man, I would be very much obliged to you."

As the chauffeur felt for the starter and threw in the clutch Bob was desperately conscious of the old woman's accusing gaze on the back of his head.

"Say," he growled at Jimmy, huddled miserably in the seat beside him, "you sure did play a bonehead trick this time. She'll just spoil the fun for all of us."

"Ah, cut it out," retorted Jimmy, wriggling uncomfortably. "She really isn't half bad once you get to know her."

"Neither is poison," snorted Bob, as the car chugged wearily once or twice, then settled down to business. "If we ever get out of this alive, we'll be lucky."

However, maybe it was the sunshine, or maybe it was Joel Banks' conversation that wrought the change in her. Be that as it may, Aunty Bixby unbent surprisingly in the next few minutes. Bob and Jimmy kept an interested eye on the back seat where Joel Banks patiently shouted dry jokes into the old woman's trumpet to the accompaniment of the latter's amused cackle.

"You see!" Jimmy said proudly. "I told you she wasn't half bad if you only got to know her."

And then, just when they were within half a mile of their destination the miserable thing happened. There was a sharp explosion and an ominous whistling of escaping air.

The driver stopped the car, got out and regarded the flat tire with a frown of despair.

"Now what's the matter?" demanded Aunty Bixby, irritably adding, with an air almost of triumph: "I always did say I hated the dratted things."

How the chauffeur managed to get that tire

changed the boys never afterward knew. Somehow or other he accomplished it and finally the car reached Doctor Dale's house without any further mishaps.

They found the doctor awaiting them, and in his courteous way he welcomed the guests of the afternoon, welcoming each one in turn and helping the radio boys to see that each one was made as comfortable as possible.

Little Dick Winters and Rose and even the older crippled boys were a trifle awed by the dignity of the occasion and the strangeness of their surroundings, but beneath the boys' merry joking and the doctor's friendly manner they soon got rid of this feeling and prepared to enjoy themselves to the limit.

Mr. Joel Banks was intensely interested in the radio apparatus, asking intelligent questions, to which the boys eagerly replied. So interested were they in the mechanical end that Dr. Dale finally informed them that if they expected to listen in at any concert that afternoon they had better get to it without further delay.

Aunty Bixby, listening anxiously through her ear trumpet, nodded emphatically at this suggestion.

"Yes," she said in her high, chronically irritable voice, "let's get along with it. I want to see

what that horn-shaped contraption can do. Looks to me like nothin' so much's an old fashioned phonygraph."

"It's far more wonderful than any phonograph," the doctor told her good-naturedly. Then turning to Bob, directed: "Let her go, Bob. It's just time to catch that concert in Pittsburgh."

Bob obeyed, and then the fun began. For an hour that seemed only a minute in length all listened to a concert of exquisite music both vocal and instrumental, a concert given by some of the world's great artists and plucked from the air for their benefit.

Once Aunty Bixby dropped her trumpet and was heard to murmur something like "drat the thing!" But Jimmy gruntingly got down on his knees and retrieved the instrument from its hiding place under a chair. Then, finding she had missed part of a violin selection, the old woman exclaimed irritably:

"There, I missed that. Have them play it over again!"

The boys looked at each other, then looked suddenly away, trying their best to control the corners of their mouths.

However, when the concert was over and the last soprano solo, flowing so truly through the horn-shaped amplifier, died away into silence they

saw that Aunty Bixby's bright old eyes were wet.

"Drat the thing!" she said, feeling blindly for a handkerchief. "Never heard tell o' such foolishness, making a body cry about nothing!"

Joel Banks sat with a knotted hand over his eyes, dreaming old dreams of days long past, days when he was young and athrill with the joy of living.

"How about a little dance music now?" asked Bob, glancing over at Doctor Dale, who nodded his consent.

"Surely," he replied. "We have to have some dance music nowadays to please the young folks."

The little cripples received this suggestion with enthusiasm and fairly shouted with delight as the snappy tune of the latest fox trot floated into the room.

"That's the stuff!" shouted Dick Winters, and the boys grinned at him.

Later they had a minstrel show that sent them all into gales of laughter. Joel Banks and Aunty Bixby were as sorry as the young folks when it was over.

Then suddenly, without warning, the stirring strains of the Star Spangled Banner filled the room, played by a master band. Suddenly, as though by some common instinct, all eyes were turned upon Joel Banks. There was a light in

the old veteran's eyes, a straightening of his whole sagging figure.

He tried to rise, faltered, felt two pairs of strong young arms lifting him, supporting him, as Bob and Joe sprang to his aid. He stood there, his hand at stiff salute, in his old eyes the fire of battle, until the last stirring note died away and the music was still. Then he sank into a chair, shaking his old head feebly.

"Those were the days!" he muttered under his breath. "Those were the good old days!"

And so the concert finally came to a close and the boys took their happily weary guests home through the mellow late afternoon, promising to do the whole thing over some day.

"They sure seemed to enjoy themselves," said Bob as the radio boys started toward home. "Aunty Bixby is a nice old lady, and as for Joel Banks——"

"Say, isn't he a dandy?" Joe demanded, and this time Herb and Jimmy chimed in:

"He sure is!"

CHAPTER XXI

THE VOICE THAT STUTTERED

THE following Saturday evening the radio boys were once more assembled at Bob's house. They were in high spirits, having prepared all their lessons for the following Monday, and were out for an evening's fun with their radio outfit. It was too early for the regular concert to start, but they were experimenting with the set, shifting the sliders around on the tuning coil in an effort to catch some of the messages sent out by near-by amateurs. It was sometimes great fun to listen in on these conversations, and often they wished that they had a sending set so that they could answer some of the remarks passed out by the ambitious senders.

For some time they had picked up nothing of interest, and were wishing for the time to come when the concert was to start, when suddenly a voice they had never heard before came out of the air. The boys gazed at each other in astonish-

ment for a few moments, and then broke into irrepressible laughter. For the voice belonged to a man who stuttered terribly, and the effect was ludicrous indeed. The strange voice rasped and stuttered its difficult way along, until some one who possessed a sending as well as a receiving set, interrupted.

"Hey there!" it said. "You're engine's missing, old timer. Let it cool off a bit and then try again."

This was evidently heard by the stutterer, for he became excited, and that did not help him much.

"S-s-shut up, y-y-you big b-b-boob," he finally managed to get out, in an infuriated tone.

"I may be a boob, but I can talk straight, anyway," replied the amateur.

This so infuriated the stuttering man that he was absolutely unable to say anything for a few moments, while the boys, with much merriment, waited expectantly for the forthcoming answer.

"S-s-s-shut up, w-w-will you?" exploded the unfortunate stutterer at last. "J-j-just you w-w-w-w——" but he was unable to finish the sentence until he stopped and gave vent to a long whistle, after which he was able to proceed.

At the sound of the whistle Bob suddenly stopped laughing and sat up straight in his chair.

"Say, fellows!" he exclaimed, "do you remem-

ber what Herb told us about the man named Dan Cassey?"

"Jerusalem!" exclaimed Joe, "I remember Herb said he stuttered and had to whistle to go on, and if that doesn't describe this bird I'll eat my hat!"

Jimmy and Herb himself caught the idea, at the same time, and they gazed speculatively at each other. There was more recrimination between the stutterer and his tormentor, and the boys listened attentively, hoping to get some clue to the whereabouts of the afflicted one's station. But they could get no hint of this, and finally the voice ceased, leaving them full of hope but with little that was definite to found their suspicions on.

"Of course, it may not mean anything at all," said Bob. "This Dan Cassey isn't the only man in the world who stutters."

"No, but there can't be many who are as bad as he is," said Joe, grinning at the recollection, even though his mind was occupied with more serious thoughts. "But it will certainly be worth our while to try to locate this person and find out what name he answers to."

The others were of the same opinion, and they listened for some repetition of the voice in the hope that its possessor might drop some clue to his identity, but although they missed most of the

concert by trying to catch the talk of the object of their interest, they heard no further word of him that evening nor for many more to come.

The next morning but one when Bob joined his companions it was plain to see that he was bursting with news.

"Say, fellows," was his salutation, "did any of you read in the morning papers of the big Radio Show that is opening up in New York City?"

They had to confess that they were innocent of any such knowledge.

"It opens to-morrow," went on Bob. "They say it's going to be one of the biggest things that ever happened. A regular rip-roaring, honest-to-goodness show. They'll have all the latest improvements in radio sets and all kinds of inventions and lectures by men who know all about it, and automobiles that run by wireless without any drivers——"

"For the love of Pete," interrupted Joe, "go a little easy and let us take it in a little at a time. Any one would think you were the barker at a sideshow. Where is this wonderful thing to be?"

"On the roof of one of the big New York hotels," answered Bob. "I forget the name just now, but it's one of the biggest in the city. What do you say, fellows, to taking it in? We ought

to get all sorts of ideas that will help us in making our sets."

"Count me in," replied Joe promptly. "That is, if my folks will let me go, and I think they will."

"Don't leave out little Jimmy," remarked that individual.

"Me too," added Herb. "That is, if dad will see it the same way I do."

"I guess our folks won't kick," Bob conjectured confidently. "I notice that they're getting almost as much interested in the game as we are. Besides we won't have to stay in the city over night. The show's in the afternoon as well as the evening and we can be home before ten o'clock."

"We'll put it up to them anyway," replied Joe.

They did "put it up" to their parents with such effect that their consent was readily obtained, though strict promises were exacted that they would spend only the afternoon in the city and take the early evening train for home.

It was a hilarious group that made their way to the city the next day, full of eager expectations of the wonders to be seen, expectations that were realized to the full.

From the moment the boys crowded into the jammed elevators and were shot to the enclosed roof in which the exhibition was held they en-

joyed one continuous round of pleasure and excitement. The place was thronged, and, as a matter of fact, many late comers were turned away for lack of room. But the boys wound in and out like eels, and there were very few things worth seeing that eluded their eager eyes. Impressions crowded in upon them so thick and fast that it was not until later that they were fully able to appreciate the wonders that were being displayed for their benefit.

They listened to talks from men skilled in radio work, they wandered about to the many booths where information was given about everything connected with wireless, they studied various types of coils, transformers, vacuum tubes, switches, aerials, terminals, everything in fact that ambitious young amateurs could wish to know.

There was the identical apparatus with its marvelously sensitive receiver, which, while installed in Scotland, had correctly registered signals from an amateur radio station in America.

A little later they stood entranced in the Convention Hall before a new, beautifully modeled radio amplifier, so massive that the volume of music it poured forth actually seemed to cause vibration in the walls of the great room in which they stood.

One of the most interesting features was the radio-controlled automobile. The crowd before

this almost incredible invention was so dense that the operator was handicapped in his demonstration.

The car was about seven feet in length, with a cylindrical mass of wire rising about six feet above its body. It was upon this that the swiftly moving car caught signals from antennae stretched across the hall. The boys watched, fascinated, as the inventor, opening and closing the switches in its mechanism by use of a radio wave of one hundred and thirty-five metres in length, caused the small car to back out of its garage and run about the hall without a driver, delivering papers and messages, afterward returning to the garage.

Then they saw the transmitters that could shoot radio messages into space, and hung entranced over the moving pictures of what happens in a vacuum tube. Nothing escaped them, and they "did" the show thoroughly, so thoroughly in fact that at the end they were, as Joe expressed it, "all in."

"Gee, I knew that show was going to be great," remarked Bob happily, as they were returning home on the train. "But I didn't have any idea that it was going to be such a whale."

"It was a pippin," agreed Joe, as he snuggled back still further in his seat.

Jimmy sighed gustily.

"What's the matter, Doughnuts?" asked Bob.

"I was just pitying," replied Jimmy, "the poor boobs who didn't see it."

"And that's no joke!" said Joe. "Seeing all those things is going to be a big help toward winning those prizes."

"Who said I was joking?" retorted Jimmy. "I wasn't. That show was the dandiest thing I ever saw."

CHAPTER XXII

THE STOLEN SET

MEANWHILE, Bob, Joe and Jimmy were working like beavers on their prize sets, and were making great progress. Mr. Ferberton's offer had aroused great interest in the town, and several other boys were working for the coveted prizes. The knowledge of this only spurred the radio boys to greater efforts, and they began to acquire a deeper insight into the mysteries of radio work with every day that passed. They began to talk so learnedly of condensers and detectors that Herb wished more than once that he had started to make a set of his own, and he was at last driven in self defense to study up on the subject so as not to be left too far behind.

Almost two weeks had passed since they first started work on the prize sets when one evening Doughnuts came rushing into Bob's workroom with woe writ large on his round countenance.

"What do you think, Bob!" he burst out. "Some crook has stolen my set."

"Stolen your set!" echoed Bob. "What in the world do you mean?"

"Just that," went on poor Jimmy. "I had it in my father's shop back of the house. I was working on it last night, and when I went out this evening, it was gone."

"Was anything else stolen?" asked Bob.

"No. That's the funny thing about it," replied Jimmy. "Nothing was touched but my set."

"Then it looks to me as though Buck Looker or one of his crowd had taken it," said Bob, after thinking a few minutes. "You know they have it in for us, and they'd do anything to harm us."

"Yes, but if that's so, why should they steal my set instead of yours or Joe's?" argued Jimmy.

"Probably because it was easier to steal yours," said Bob. "We keep our sets in the house, while yours, being in a shed at the back, would be a lot easier to get away with."

"Jimminy crickets! I'll bet you're right," exclaimed Jimmy. "It would be just the kind of dirty trick they'd be likely to play, too."

"If it's Buck Looker and his crowd that's responsible for this, we'll have your set back or know the reason why," said Bob, throwing down his tools. "Let's go around and get the others, and we'll have a council of war."

A peculiar whistle outside their friends' houses brought them out at once, and when they were all together Jimmy told them about his misfortune. They were as indignant as Bob, and had little doubt that Buck Looker was the author of the outrage.

"It's dollars to doughnuts that gang's got it," said Bob. "Now, when a thing needs to be done, it's usually best to do it right away. We've got to get Jimmy's set back, and I've got an idea where we can find it."

"Where?" they all asked in chorus.

"Well, you know that crowd often hang out in that shack back of Terry Mooney's house—the place that his father built to keep an automobile in, and then could never get enough money to buy the automobile. They spend a lot of their time there. And if they've taken Jimmy's outfit, that's the place they'd naturally keep it. They wouldn't want to take it into any of their homes, because then their folks would likely find out about it and make them give it up."

"Gee, I believe you're right!" exclaimed Joe. "Let's go there right away and accuse them of it."

"Better yet, let's go there and take it away from them," proposed Bob, with a grim set to his mouth. "Are you with me?"

For answer they all started off in the direction

of Terry Mooney's house, and as they went, Bob outlined a plan of attack.

"We'll scout around first, and see if they're in the place," he said. "If they are, we may be able to get a look inside and see if there is any sign of Jimmy's outfit. If they've got it, we can decide the best way to take it away from them after we get there."

CHAPTER XXIII

BATTERING IN THE DOOR

TEN minutes of brisk walking brought the radio boys to their goal. The Mooney family inhabited a large but dilapidated house, in the rear of which was the small building that the head of the Mooney family had erected in a moment when his enthusiasm had far outrun his bank account. He had never been able to buy a car to put in the building, and his son and his cronies had found it an ideal place to meet, smoke cheap cigarettes, and plot mischief.

As they neared this shack, the radio boys kept in the shadows and approached noiselessly, it being Bob's plan to take the gang by surprise, if possible. Besides, he wanted to be absolutely sure that Jimmy's stolen set was in the building before making any further move.

Noiselessly as shadows, the boys crept up to the shack until they were close enough to hear voices inside. They could easily recognize Buck Looker's arrogant voice, and at times the whining replies of Terry and Carl.

There was only one small window in the building, and that was covered by a square of cloth. At the end of the shack opposite the window were two large doors, both closed. An electric light cord had been strung from the house, supplying current to one or more lamps inside the shack. The four radio boys prowled about the building, trying to find some place from which they could get a view of the interior. At last Joe found a place where a crack in a plank allowed them to see in.

All three of the gang were inside, seated on rickety chairs about a rough pine table. And on this table, sure enough, was the missing radio outfit!

Jimmy clenched his fists when he saw this, and was for an immediate attack. But Bob had a more crafty scheme in his head.

"Here's a better stunt," he said, drawing his friends off to a little distance so that they could talk without running the chance of being overheard.

"If we break in on them, they might make trouble for us later," said Bob. "But if we put their light out first, we'll be able to get hold of Jimmy's outfit without their really knowing who's doing it."

"Cut the electric light cord, you mean?" said Joe, getting the idea like a flash.

"That's the idea," said Bob. "Suppose you cut the cord, Jimmy, and the second you do, we'll all rush those front doors. They've probably got 'em locked but if we land heavily enough I don't think that will stop us. I'll make for the table and grab Jim's outfit, and when you hear me whistle twice you'll know I've got it, and we'll get out. They'll probably be fighting each other in the dark for a while before they even know we're gone."

"Bob, I take off my hat to you," said Joe admiringly. "We'll work it just as you say."

Doughnuts had a pair of wire cutters with him, which he had used when working on his set. Silent as ghosts, the four friends crept back to the shack, and Jimmy carefully separated the two wires of the cable and caught one of them between the jaws of his cutter.

"When the light goes out, we rush," whispered Bob. "Give us a few seconds to get set, Jimmy, and then cut!"

Bob, Joe, and Herb withdrew about ten feet from the big front doors and waited tensely for the light to go out.

A scarcely audible click, and the shack was plunged in darkness.

Like projectiles shot from a gun, the boys hurled themselves against the doors, landing with a crashing impact that shattered the lock into

fragments and tore one of the doors bodily from its rusty hinges. Shouts of terror rose from the panic-stricken bullies inside, taken completely by surprise with no idea of what had come upon them. The radio boys scattered them head over heels as they made for the table, and the shack was a pandemonium of shouts, cries, and the crash of overturned chairs. It was the work of only a few seconds for Bob to reach Jimmy's radio set, and having secured this, he whistled twice to signify success, and made for the door.

Meanwhile, as he had foreseen, the bullies, tangled in a heap on the floor, were grappling with each other, pounding away at whatever came handiest to their fists. The radio boys, having got what they came after, left the gang struggling in the dark, and made their way back to Jimmy's house, doubled up with laughter at times, as they thought of the ludicrous discomfiture of their foes.

CHAPTER XXIV

ON THE TRAIL

"Gosh!" exclaimed Herb, wiping tears of merriment from his eyes. "I'll never forget this night if I live to be a hundred. Oh, my, but that was rich!"

"Those fellows will learn after a while that it doesn't pay to get gay with this bunch," said Joe. "I think we let them off easy for stealing Doughnuts' outfit, as it is. We might have landed them a few swift ones while we were there."

"They saved us even that trouble," Bob pointed out. "They were punching each other hard enough to suit any one."

"That's right," said Joe, laughing. "I guess by this time they're sorry they stole that set."

"I'm mighty grateful to you fellows for helping me get this back," said Jimmy, looking lovingly at his set, which had escaped with hardly a scratch. "When I found it was gone, I pretty nearly gave it up for lost."

"'One for all and all for one,'" quoted Bob.

"We'll teach Buck Looker and his set to let us alone, if it's possible to teach them anything. But I suppose we might as well run along now, because it's getting pretty late."

"I happen to know that there's a big pan of rice pudding in the ice box," said Jimmy. "It may be late, but it's never too late for that, is it?"

"Lead us to it!" the other three chanted in unison, and in a short time the rice pudding was only a memory. Then the boys said good-night and parted, each to his own home, well satisfied with the result of their adventure.

Bob and Joe were walking down Main Street the next day, when they met Buck Looker and Carl Lutz, both looking very much the worse for wear.

Joe stopped and gazed at them in apparent astonishment.

"Why, what have you fellows been doing, anyway?" he inquired. "You look as though you had had an argument with a steam roller."

"Yes, and the steam roller must have won," grinned Bob.

"You know well enough what happened to us," growled Buck Looker malignantly. "If ever you fellows come around our clubhouse again, we'll make you wish you hadn't."

"Clubhouse?" queried Joe innocently. "What

does he mean, Bob? I didn't know he and Lutz had a clubhouse."

"I mean that garage back of the Mooney's place," said Buck irately. "That's our clubhouse, and you fellows had better not try any rough house there again, or there'll be trouble."

"Oh, I know the place he means," said Bob, after making a pretence of puzzled thinking. "He means that tumbled-down shack where Mr. Mooney keeps his garden tools. I'm sure we'd never want to go near a place like that, would we, Joe?"

"Of course not," said Joe. "I wouldn't ask a respectable dog to go near that place."

Looker and Lutz had been growing angrier all the time during this dialogue, but after their recent experiences with the radio boys they did not quite dare resort to open hostilities. But if looks could have killed, Bob and Joe would have dropped dead on the spot.

"If you've got anything to say, now's the time to say it," said Bob, gazing steadily at the bullies with a look in his eyes that made them shift uneasily.

"We're in a big hurry, or we'd tend to you right now," blustered Buck. "Come on, Carl. We'll fix them some other time."

"No time like the present, you know," said Joe.

But the two bullies had little inclination for a fair fight, as they had a pretty shrewd suspicion of how they would fare in that event. With ugly sidewise looks they passed on, leaving Bob and Joe in possession of the field.

"They're beginning to think we're bad medicine," said Joe. "A little more training, Bob, and they'll even be afraid to talk back to us."

"Looks that way, doesn't it," said Bob, laughing.

The two radio boys went on to their destination, which was the hardware store, where they both wanted to buy some wire and other supplies. What was their surprise, when they went inside, to find Frank Brandon, the radio inspector, talking to the proprietor.

As the boys entered, Brandon glanced at them, and then, as recognition came into his eyes, he extended his hand.

"Hello, there!" he exclaimed. "How have you been since I saw you? How's the wireless coming on?"

"It's O K," said Bob. "We're both trying for the Ferberton prize, you know."

"That's fine," said Brandon heartily. "The prizes are to be given out pretty soon, aren't they?"

"Yes. And we're both hoping that if one of us doesn't get it, the other will," said Joe.

"If neither one gets it, it won't be anything against you," said Brandon. "I hear there are a lot of sets entered, and some of the fellows who have made them have been at the game a lot longer than you have."

"We're doing a lot of hoping, anyway," said Bob. "Are they keeping you pretty busy these days?"

"I should say so," said the radio inspector. "There's one fellow in particular that I'm having a lot of trouble with. I've got his location approximately, but in the neighborhood where he should be I haven't been able to locate any antennae to indicate the presence of a radio station. Usually it's easy enough, but this fellow seems to be a sly fox."

"How in the world do you locate an unauthorized station, anyway?" queried Bob.

"In each district in which there is a radio inspector we have what we call directional finders. These consist of a combination of a loop aerial and a compass and a radio receiving set. We have complete maps of the district. When the man we're after is sending, we swing the loop aerial around until the signals reach their loudest tone. Then a reading is taken on the compass. This action is repeated several times, after which we turn the loop so as to tune out all sound. During the silent period a line is drawn on the

map at right angles to the direction of the loop. This line indicates the direction from which the sounds are coming. This takes place at the same time at all three stations, and where the lines on the map intersect is the point where the offender can be found."

"But I suppose that location isn't very exact, is it?" asked Bob.

"No; but it's usually exact enough," said Brandon. "We go to the place indicated on the map, and look about in the neighborhood for aerials. Anybody owning them has to show his license, if he has one, and if he hasn't—well, that's the man we're after."

"Simple enough," commented Bob. "But when you don't know how it's done, it seems like looking for a needle in a haystack."

"Yes, and by all the rules it should be easier than usual to locate this offender," said the radio inspector, "because he has a peculiarity that marks him out."

"I'll bet I know what it is, too," said Bob quickly.

"You do?" said Brandon, surprised.

"He stutters badly, and then has to whistle before he can go on, doesn't he?" said Bob.

"That's the man, all right," said Brandon. "Do you know anything about him?"

"Well, if he's the man we think he is, we don't

know much good about him," said Bob, and he proceeded to tell Brandon about Dan Cassey and the mean way he had tricked Nellie Berwick and stolen her money.

"So you see you're not the only one looking for the stuttering man," said Bob, in conclusion. "We'd like pretty well to find out where he is ourselves."

"But what makes you think this man I'm looking for is the same one you're after?" asked Brandon.

"In the first place, there aren't many people who stutter so badly," said Bob. "And in the second place, Miss Berwick told us that she saw some radio apparatus on his desk when she was in his office."

"That certainly goes a long way in hitching up the two," said the inspector thoughtfully. "Now," he continued, after studying a few minutes longer, "I have a proposition to make. I've checked up my calculations, and I'm going to have another try at locating this man to-morrow. As you're both interested in finding him, too, why not go with me and help me? Between the three of us we ought to find him."

"Nothing could suit me better!" exclaimed Bob. "How about you, Joe?"

"Fine," replied his chum. "To-morrow's Saturday, so we can go all right. But don't forget

that we want to be back when the prize winners are announced," he said, struck by a sudden thought.

"Oh, it won't take us very long to get on the ground," said Brandon. "I figure this man we're after is somewhere in Lansdale, and you know that isn't more than a two hours' run by automobile. If we haven't found him by the time you should be leaving in order to get back here on time, you two can come back by train, and I'll stay there. But if we get an early start I think the three of us, working together, should locate our man pretty quickly. Lansdale isn't a very large place, you know."

"I can start as early as you like," said Bob. "How about you, Joe?"

"That goes for me, too," said Joe. "Set your own time, Mr. Brandon."

"Well, then, suppose you both meet me at Hall's garage at eight sharp to-morrow morning," proposed Frank Brandon. "I'll hire a good car and be all ready to start by that time."

"We'll be there on the dot," promised Bob, and they all shook hands on the bargain.

Bob and Joe made their purchases, said goodbye to the radio inspector, and left the store excitedly discussing their chances of locating the rascal Cassey and perhaps recovering Nellie Berwick's stolen money. When they parted to go

home, each renewed his promise to be on time the following morning, and went his way filled with hope that at last the scoundrel would perhaps be brought to justice.

"But I wish we could be sure that that old rascal would be caught up with and be made to give back Miss Berwick's money," reflected Bob, as he turned in at his own home. "She's in Clintonia again. I saw her at a distance to-day."

CHAPTER XXV

THE PRIZE

BUT before going to bed that night, Bob had an idea which he proceeded at once to put into execution, with the result that there were some lively telephone exchanges and considerable excitement in various quarters.

The fruit of his work was seen the following morning, when, on reaching Hall's garage, Mr. Brandon, instead of finding only the two boys waiting for him, found also Miss Nellie Berwick and a Mr. Edgar Wilson, a keen, wide-awake lawyer of Clintonia, whom Miss Berwick had retained to look after her interests.

"I tried to get you also on the telephone last night, Mr. Brandon," Bob explained, after introductions had been made, "but I couldn't find you in. So I took the liberty of asking Miss Berwick and Mr. Wilson to go along with us on the chance that we might round up Dan Cassey."

"That's all right," responded Mr. Brandon warmly. "The boys have already told me, Miss

Berwick, of the dastardly trick that fellow played on you, and I shall be only too happy to have you and your lawyer go along with us. It would give me the keenest satisfaction to see that fellow get his deserts."

Miss Berwick thanked him heartily and the party took their places in the automobile, which held five persons comfortably and was of a modern type. That it was speedy was soon proved by the way it sped along the road under the skillful guidance of Mr. Brandon. A rain two days before had laid the dust, and the roads were in perfect condition. In a surprisingly short time they had come in sight of Lansdale, a little village on the coast.

They stopped at the post-office and Brandon climbed out of the car and went in. The postmaster eyed him warily, and was at first somewhat disinclined to give any information, but the sight of the badge that proclaimed Mr. Brandon a government official unloosed his tongue and he talked freely.

"Know anybody about here by the name of Cassey?" asked Mr. Brandon.

"Cassey? Cassey?" repeated the postmaster ruminatively. "No, there's nobody of that name around here. Or if there is, he's never been to this office to get his mail."

"The man I'm speaking of stutters—stutters

badly," said the inspector. "Is there any one like that in town?"

"Just one," replied the postmaster. "And he stutters enough for a dozen. Worst case I ever knew. Gets all tangled up and has to whistle to go on. But his name's Reddy."

"Has he been here long?" pursued the inspector.

"Oh, a matter of a month or two," was the reply. "Never saw him before this year. Thought perhaps he was one of the early birds of the summer visitors that was rushing the season."

"Where does he live?" asked Mr. Brandon.

"Just a little way up the street," replied the postmaster. "Come to the window here and I'll show you the house."

He pointed out a little cottage of rather dilapidated aspect, above which the keen eye of Mr. Brandon saw the end of an aerial.

He thanked the postmaster and went out to his party.

"I think we have our game bagged all right," he remarked, and rejoiced to see the light that came into Miss Berwick's eyes, "but of course I'm not sure as yet."

He told them the result of his inquiries, and they were delighted.

"I tell you what I think we had better do," he suggested. "I propose that we leave the automobile here and go up to the house on foot.

Three of us will go in, while Miss Berwick and Mr. Wilson will stay out of sight at the side of the house until they get the sign to enter. The surprise may lead to confession and restitution if properly managed."

The others signified their consent to this and proceeded toward the house. Miss Berwick and her lawyer stood at the side, where they could not be seen from the door, and the inspector, followed by the boys, mounted the steps and rang the bell.

There was a moment's delay and then the door opened. A short thick-set man stood there with his hand on the knob. He wore large horn glasses, which may have been because of defective sight or possibly as a disguise. The eyes behind the glasses were furtive and shifty, and the mouth was mean and avaricious.

"Is this Mr. Reddy?" asked the inspector politely.

"Th-th-that's my name," answered the man. "W-what can I do f-f-for you?"

"That depends," replied Mr. Brandon. "I called to see you on a matter of business. May I come in?"

The man eyed his visitors with a look of apprehension and annoyance, but finally assented with a nod of his head and led the way into a small and meagerly furnished living room.

"I see that you have a radio set here," remarked Mr. Brandon, seating himself and looking around the room.

"Y-y-y-yes," stuttered the man. "W-what about it?"

The inspector threw back his coat and showed his badge. At the sight of this symbol of authority the man gave a violent start.

"I happen to be a radio telephone inspector," explained Mr. Brandon.

"O-oh," said the man, visibly relieved that it was no worse. "W-why do you want to see me?"

"Because you've been violating the government regulations," replied the inspector sternly. "There have been a number of complaints against you, and you've got yourself into serious trouble."

As he spoke he crossed his legs, which was the sign agreed on, and unseen by the man who during this conversation had had his back toward the boys, Bob tiptoed out to the street and beckoned to Miss Berwick and her lawyer, who followed him promptly and softly into the room.

"I'm s-s-sorry," the man was saying at the moment. "I d-d-d-didn't mean——"

Just then Bob slammed the door shut with a bang. The man jumped, and as he turned about

came face to face with Miss Berwick, who stood regarding him with a look of scorn.

So startled was the man that his glasses dropped from his nose and he had to grasp a chair to hold himself steady. His face turned a greenish hue and rank fright came into his narrow eyes.

"How do you do, Mr. Cassey?" asked Miss Berwick. "Do you happen to have my mortgage with you?"

"Mr. Cassey?" repeated Mr. Brandon with affected surprise. "He told me his name was Reddy. How about it?" he asked, and his voice had the ring of steel. "Have you been trying to deceive a government officer?"

The detected rascal dropped weakly into the chair whose back he had been holding. He seemed near total collapse.

"Come now," said Mr. Wilson, stepping forward and tapping him on the shoulder, "the game's up, Cassey. We've got you at last. The money or the mortgage, Cassey. Come across with one or the other and come across quick. It's that or jail. Take your choice."

Dan Cassey, shaking in every limb, tried to temporize, and stuttered until he got red in the face and seemed on the point of apoplexy. But the lawyer was inflexible, and at last Cassey took

a key from his pocket and opened a drawer from which he took a paper and handed it over to Mr. Wilson. The latter ran his eyes over it and his face lighted up with satisfaction.

"It's the mortgage, all right," he said, as he handed it over to his client. "That settles his account with you, Miss Berwick, and I congratulate you. But it doesn't settle his account with the law. You contemptible scoundrel," he said, addressing Cassey, "you ought to serve a good long term for this."

Cassey, utterly broken, fell on his knees at this and fairly begged for mercy. He stuttered so horribly that the boys would have had to laugh if it had not been for the tragedy of the wretched creature groveling in such abasement.

Miss Berwick intervened and held a conference with her lawyer in a low voice.

"Well," said the latter finally, "of course, if you refuse to make a charge against him, there's nothing to do but to let him go, though he ought to be sent to jail as a warning to others. Get up, you worm," he continued, addressing Cassey, "and thank your stars that Miss Berwick's generosity keeps you from getting the punishment you so richly deserve."

They left him there in his shame and disgrace, and went back to their car, after Mr. Brandon had warned the rascal that any repetition of his

minor offense would bring down swift penalty from the government.

It was a happy party that rode back to Clintonia. There were tears in Miss Berwick's eyes as she thanked again and again the boys who for the second time had done her such a signal service. And Bob and Joe had a sense of satisfaction and exhilaration that was beyond all words to express.

On their way they passed through Ocean Point, a summer colony where many of the residents of Clintonia had cottages. It was on the seashore and every foot of it was familiar to the boys, whose own parents spent a part of the summer there every year.

"It won't be long now before we'll be on this old stamping ground of ours," remarked Joe, as he looked at the surf breaking on the shore. "It will be good to be here again."

"Right you are," replied Bob. "And we'll bring our radio sets along. This summer will be more interesting than any we've known before."

How fully that prophecy was carried out, and how exciting were the adventures that awaited the boys will be told in the second book of this series, to be entitled: "The Radio Boys at Ocean Point; Or, The Message That Saved the Ship."

Herb and Jimmy were as delighted as their chums when they heard of the way that Cassey had been trapped and forced to make restitution. But many of the details had to be postponed until another time, for just now their thoughts were full of the Ferberton prize which was to be awarded that night, and for which they were busy in making their final preparations.

The town hall that night was crowded, and many had to be content with standing room. Upon the platform were numerous wireless telephone sets that had been received for the competition.

Mr. Ferberton himself presided at the gathering. He made a most interesting address, in which he dealt with the wonders of wireless and gave a review of its latest developments. His own set, which was one of the largest and most powerful the radio boys had ever seen, had been installed on the platform with a large horn attached, and for an hour and a half, while waiting for the prizes to be awarded, the auditors were regaled with a delightful concert.

In the meantime, a committee of three radio experts had been examining the sets submitted in competition. They subjected them to various tests, taking into account the care displayed in workmanship, the ingenuity shown in the choice of materials, and the clearness of tone discerned

when each in turn was connected with the aerial and put to a practical test. The choice was difficult, for many of them showed surprising excellence for amateurs.

At last, however, the awards were decided on, and Mr. Ferberton, holding the list in his hand, advanced to the edge of the platform. The silence became so intense that one could almost have heard a pin drop.

"The first prize," he said after a few words of introduction, "is awarded to Robert Layton."

There was a roar of applause, for no one in town was more popular than Bob.

"The second prize goes to Joseph Atwood," continued Mr. Ferberton, and again the hall rocked with applause.

"If there had been a third prize," the speaker concluded, "it would have been awarded to James Plummer. As it is, he receives honorable mention." And Jimmy too had his share of the cheering and hand clapping.

Long after the lights were out and the audience dispersed, the chums sat on Bob's porch, elated and hilarious.

"I'm the only rank outsider," grinned Herb. "I take off my hat to the rest of the bunch. You're the fellows!"

"You needn't take it off to me," laughed Jimmy. "I got only honorable mention, and

there isn't much nourishment in that. Not half as much as there is in a doughnut. I could have used that money, too."

"What are you two bloated plutocrats thinking of?" asked Herb of Bob and Joe, who had let the others do most of the talking.

"Radio," replied Joe.

"The most wonderful thing in the world," declared Bob.

THE END

THE TOM SWIFT SERIES

By VICTOR APPLETON

UNIFORM STYLE OF BINDING. INDIVIDUAL COLORED WRAPPERS.

These spirited tales, convey in a realistic way, the wonderful advances in land and sea locomotion. Stories like these are impressed upon the memory and their reading is productive only of good.

TOM SWIFT AND HIS MOTOR CYCLE
TOM SWIFT AND HIS MOTOR BOAT
TOM SWIFT AND HIS AIRSHIP
TOM SWIFT AND HIS SUBMARINE BOAT
TOM SWIFT AND HIS ELECTRIC RUNABOUT
TOM SWIFT AND HIS WIRELESS MESSAGE
TOM SWIFT AMONG THE DIAMOND MAKERS
TOM SWIFT IN THE CAVES OF ICE
TOM SWIFT AND HIS SKY RACER
TOM SWIFT AND HIS ELECTRIC RIFLE
TOM SWIFT IN THE CITY OF GOLD
TOM SWIFT AND HIS AIR GLIDER
TOM SWIFT IN CAPTIVITY
TOM SWIFT AND HIS WIZARD CAMERA
TOM SWIFT AND HIS GREAT SEARCHLIGHT
TOM SWIFT AND HIS GIANT CANNON
TOM SWIFT AND HIS PHOTO TELEPHONE
TOM SWIFT AND HIS AERIAL WARSHIP
TOM SWIFT AND HIS BIG TUNNEL
TOM SWIFT IN THE LAND OF WONDERS
TOM SWIFT AND HIS WAR TANK
TOM SWIFT AND HIS AIR SCOUT
TOM SWIFT AND HIS UNDERSEA SEARCH
TOM SWIFT AMONG THE FIRE FIGHTERS
TOM SWIFT AND HIS ELECTRIC LOCOMOTIVE

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

THE BOYS OF COLUMBIA HIGH SERIES

By GRAHAM B. FORBES

Never was there a cleaner, brighter, more manly boy than Frank Allen, the hero of this series of boys' tales, and never was there a better crowd of lads to associate with than the students of the School. All boys will read these stories with deep interest. The rivalry between the towns along the river was of the keenest, and plots and counterplots to win the champions, at baseball, at football, at boat racing, at track athletics, and at ice hockey, were without number. Any lad reading one volume of this series will surely want the others.

THE BOYS OF COLUMBIA HIGH
Or The All Around Rivals of the School

THE BOYS OF COLUMBIA HIGH ON THE DIAMOND
Or Winning Out by Pluck

THE BOYS OF COLUMBIA HIGH ON THE RIVER
Or The Boat Race Plot that Failed

THE BOYS OF COLUMBIA HIGH ON THE GRIDIRON
Or The Struggle for the Silver Cup

THE BOYS OF COLUMBIA HIGH ON THE ICE
Or Out for the Hockey Championship

THE BOYS OF COLUMBIA HIGH IN TRACK ATHLETICS
Or A Long Run that Won

THE BOYS OF COLUMBIA HIGH IN WINTER SPORTS
Or Stirring Doings on Skates and Iceboats

12mo. Illustrated. Handsomely bound in cloth, with cover design and wrappers in colors.

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

THE OUTDOOR CHUMS SERIES

By CAPTAIN QUINCY ALLEN

The outdoor chums are four wide-awake lads, sons of wealthy men of a small city located on a lake. The boys love outdoor life, and are greatly interested in hunting, fishing, and picture taking. They have motor cycles, motor boats, canoes, etc., and during their vacations go everywhere and have all sorts of thrilling adventures. The stories give full directions for camping out, how to fish, how to hunt wild animals and prepare the skins for stuffing, how to manage a canoe, how to swim, etc. Full of the spirit of outdoor life.

THE OUTDOOR CHUMS
Or The First Tour of the Rod, Gun and Camera Club.

THE OUTDOOR CHUMS ON THE LAKE
Or Lively Adventures on Wildcat Island.

THE OUTDOOR CHUMS IN THE FOREST
Or Laying the Ghost of Oak Ridge.

THE OUTDOOR CHUMS ON THE GULF
Or Rescuing the Lost Balloonists.

THE OUTDOOR CHUMS AFTER BIG GAME
Or Perilous Adventures in the Wilderness.

THE OUTDOOR CHUMS ON A HOUSEBOAT
Or The Rivals of the Mississippi.

THE OUTDOOR CHUMS IN THE BIG WOODS
Or The Rival Hunters at Lumber Run.

THE OUTDOOR CHUMS AT CABIN POINT
Or The Golden Cup Mystery.

12mo. Averaging 240 pages. Illustrated. Handsomely bound in Cloth.

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

THE MOVING PICTURE BOYS SERIES

BY VICTOR APPLETON

UNIFORM STYLE OF BINDING. INDIVIDUAL COLORED WRAPPERS.

Moving pictures and photo plays are famous the world over, and in this line of books the reader is given a full description of how the films are made—the scenes of little dramas, indoors and out, trick pictures to satisfy the curious, soul-stirring pictures of city affairs, life in the Wild West, among the cowboys and Indians, thrilling rescues along the seacoast, the daring of picture hunters in the jungle among savage beasts, and the great risks run in picturing conditions in a land of earthquakes. The volumes teem with adventures and will be found interesting from first chapter to last.

THE MOVING PICTURE BOYS
THE MOVING PICTURE BOYS IN THE WEST
THE MOVING PICTURE BOYS ON THE COAST
THE MOVING PICTURE BOYS IN THE JUNGLE
THE MOVING PICTURE BOYS IN EARTHQUAKE LAND
THE MOVING PICTURE BOYS AND THE FLOOD
THE MOVING PICTURE BOYS AT PANAMA
THE MOVING PICTURE BOYS UNDER THE SEA
THE MOVING PICTURE BOYS ON THE WAR FRONT
THE MOVING PICTURE BOYS ON FRENCH BATTLEFIELDS
MOVING PICTURE BOYS' FIRST SHOWHOUSE
MOVING PICTURE BOYS AT SEASIDE PARK
MOVING PICTURE BOYS ON BROADWAY
THE MOVING PICTURE BOYS' OUTDOOR EXHIBITION
THE MOVING PICTURE BOYS' NEW IDEA

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

THE MOVING PICTURE GIRLS SERIES

By LAURA LEE HOPE

Author of "The Bobbsey Twins Series."

12mo. BOUND IN CLOTH. ILLUSTRATED. UNIFORM STYLE OF BINDING

The adventures of Ruth and Alice DeVere. Their father, a widower, is an actor who has taken up work for the "movies." Both girls wish to aid him in his work and visit various localities to act in all sorts of pictures.

THE MOVING PICTURE GIRLS
Or First Appearance in Photo Dramas.

Having lost his voice, the father of the girls goes into the movies and the girls follow. Tells how many "parlor dramas" are filmed.

THE MOVING PICTURE GIRLS AT OAK FARM
Or Queer Happenings While Taking Rural Plays.

Full of fun in the country, the haps and mishaps of taking film plays, and giving an account of two unusual discoveries.

THE MOVING PICTURE GIRLS SNOWBOUND
Or The Proof on the Film.

A tale of winter adventures in the wilderness, showing how the photo-play actors sometimes suffer.

THE MOVING PICTURE GIRLS UNDER THE PALMS
Or Lost in the Wilds of Florida.

How they went to the land of palms, played many parts in dramas before the camera; were lost, and aided others who were also lost.

THE MOVING PICTURE GIRLS AT ROCKY RANCH
Or Great Days Among the Cowboys.

All who have ever seen moving pictures of the great West will want to know just how they are made. This volume gives every detail and is full of clean fun and excitement.

THE MOVING PICTURE GIRLS AT SEA
Or a Pictured Shipwreck that Became Real.

A thrilling account of the girls' experiences on the water.

THE MOVING PICTURE GIRLS IN WAR PLAYS
Or The Sham Battles at Oak Farm.

The girls play important parts in big battle scenes and have plenty of hard work along with considerable fun.

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

SIX LITTLE BUNKERS SERIES

By LAURA LEE HOPE

Author of "The Bobbsey Twins Books,"
"The Bunny Brown Series,"
"The Make-Believe Series," Etc.

Durably Bound. Illustrated. Uniform Style of Binding

Delightful stories for little boys and girls which sprung into immediate popularity. To know the six little Bunkers is to take them at once to your heart, they are so intensely human, so full of fun and cute sayings. Each story has a little plot of its own---one that can be easily followed---and all are written in Miss Hope's most entertaining manner. Clean, wholesome volumes which ought to be on the bookshelf of every child in the land.

SIX LITTLE BUNKERS AT GRANDMA BELL'S
SIX LITTLE BUNKERS AT AUNT JO'S
SIX LITTLE BUNKERS AT COUSIN TOM'S
SIX LITTLE BUNKERS AT GRANDPA FORDS
SIX LITTLE BUNKERS AT UNCLE FRED'S
SIX LITTLE BUNKERS AT CAPTAIN BEN'S
SIX LITTLE BUNKERS AT COWBOY JACK'S

GROSSET & DUNLAP, PUBLISHERS, NEW YORK

THE BOBBSEY TWINS BOOKS

For Little Men and Women

By LAURA LEE HOPE

Author of "The Bunny Brown" Series, Etc.

12mo. DURABLY BOUND. ILLUSTRATED. UNIFORM STYLE OF BINDING

Copyright publications which cannot be obtained elsewhere. Books that charm the hearts of the little ones, and of which they never tire.

THE BOBBSEY TWINS

THE BOBBSEY TWINS IN THE COUNTRY

THE BOBBSEY TWINS AT THE SEASHORE

THE BOBBSEY TWINS AT SCHOOL

THE BOBBSEY TWINS AT SNOW LODGE

THE BOBBSEY TWINS ON A HOUSEBOAT

THE BOBBSEY TWINS AT MEADOW BROOK

THE BOBBSEY TWINS AT HOME

THE BOBBSEY TWINS IN A GREAT CITY

THE BOBBSEY TWINS ON BLUEBERRY ISLAND

THE BOBBSEY TWINS ON THE DEEP BLUE SEA

THE BOBBSEY TWINS IN THE GREAT WEST

GROSSET & DUNLAP, PUBLISHERS, NEW YORK